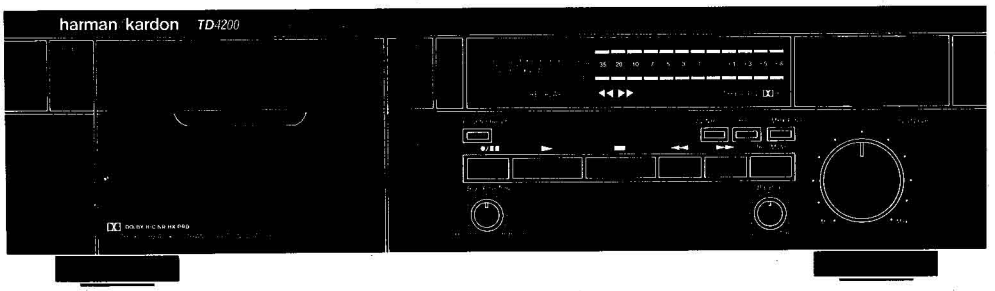
The Harman Kardon
Model TD4200

Manual 161A

CD TRANSCRIPTION QUALITY CASSETTE DECK

Technical Manual



The following marks found in the parts list of this manual identify the models as follows.

- (BK) : North America area model Black version
- (I) : International model
- (IB) : International model Black version
- (G) : German model
- (GB) : German model Black version
- (BB) : Australia model Black version

harman/kardon

240 Crossways Park West, Woodbury, N.Y. 11797
1112-3152161A4 P-119010 2000 Printed in Japan

SPECIFICATIONS

		Nominal	Limit
Track Configuration		4-track 2 Channel Stereo Cassette Deck	
• MECHANICAL SECTION			
Record/Playback Tape Speed Drift 4.75cm/sec.		0.2% ± 2.0%	
Wow and Flutter		0.05% (NAB) ≤ 0.1% 0.08% (CCIR)	
Take Up Torque		50gr.cm	35 ~ 70gr.cm
Back Tension		4gr.cm	2 ~ 6gr.cm
F.FWD Torque		100gr.cm	70 ~ 150gr.cm
REW Torque		100gr.cm	70 ~ 150gr.cm
F.FWD/REW Time (C-60 Tape)		90sec.	≤ 100sec.
• AMPLIFIER SECTION			
Bias Frequency		105kHz ± 5kHz	
Playback Output		640mV ± 1.5dB	
Signal-to-Noise Ratio at Line Input (Input 1kHz, 100mV) IHF-A WTD at Dolby Level			
Dolby NR off			
	LN	51dB	
	CrO_2	54dB	
	Metal	54dB	
Dolby B NR			
	LN	61dB	
	CrO_2	64dB	≥ 60dB
	Metal	64dB	≥ 60dB
Dolby C NR			
	LN	66dB	
	CrO_2	70dB	≥ 66dB
	Metal	70dB	≥ 66dB

		Nominal	Limit
Channel Separation		45dB	≥ 35dB
Crosstalk		70dB	≥ 60dB
Record/Playback Distortion (Input 1kHz)			
	LN	1.3%	≤ 2.0%
	CrO_2	1.8%	≤ 3.0%
	Metal	1.5%	≤ 2.0%
MPX Filter Attenuation			
at 15kHz		0.3dB	≤ 1dB
at 19kHz		35dB	≥ 30dB
Erase Ratio (Input 80Hz)			
	LN	70dB	≥ 60dB
	Metal	61dB	≥ 56dB
Input Sensitivity (Input 1kHz) at Line Input		45mV 40(min) ~ 100(max) mV	
Input Impedance (Input 1kHz) at Line Input		22kΩ 19(min) ~ 30(max) kΩ	
• DIMENSIONS (W x H x D)		17-3/8" x 5" x 12-5/8" (442 x 126 x 320 mm)	
• WEIGHT		11.9lbs (5.4kg)	
• POWER SUPPLY			
U.S.A. and Canada models		AC120V, 60Hz	
International model		AC220V/240V, 50/60Hz	
• POWER CONSUMPTION			
U.S.A. and Canada models		16W	
International model		18W	

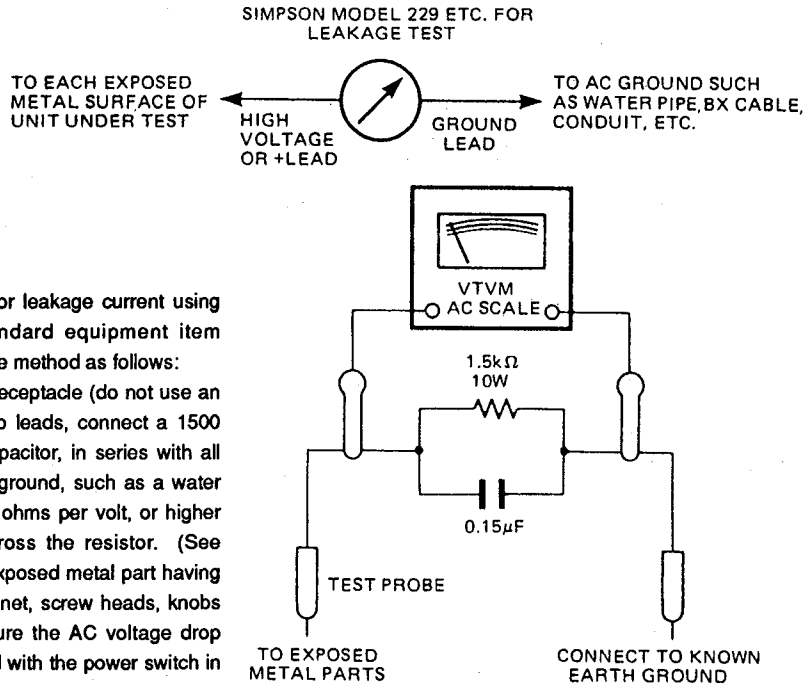
These specifications are service target specs.
Specifications and components are subject to change without notice.
Overall performance will be maintained or improved.

LEAKAGE TEST (FOR SERVICE ENGINEERS IN THE U.S.A.)

Before returning the unit to the user, perform the following safety checks:

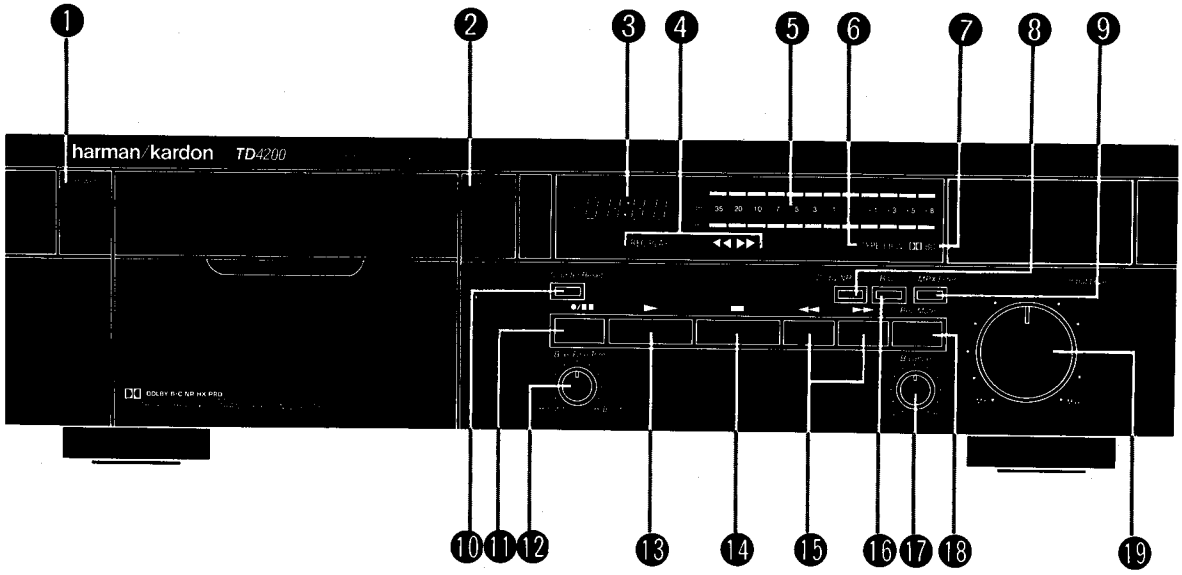
1. Inspect all lead dress to make certain that leads are not pinched or that hardware is not lodged between the chassis and other metal parts in the unit.
2. Replace all protective devices such as nonmetallic control knobs, insulating fishpapers, cabinet backs, or shields, isolation resistor-capacitor networks, mechanical insulators, etc.
3. Be sure that no shock hazard exists; check for leakage current using Simpson Model 229 Leakage Tester, standard equipment item No.21641, RCA Model WT540A or use alternate method as follows:

Plug the AC line cord directly into a 120-volt AC receptacle (do not use an Isolation Transformer for this test). Using two clip leads, connect a 1500 ohm, 10-watt resistor paralleled by a 0.15µF capacitor, in series with all exposed metal cabinet parts and a known earth ground, such as a water pipe or conduit. Use a VTVM or VOM with 1000 ohms per volt, or higher sensitivity to measure the AC voltage drop across the resistor. (See Diagram.) Move the resistor connection to each exposed metal part having a return path to the chassis (antenna, metal, cabinet, screw heads, knobs and control shafts, escutcheon, etc.) and measure the AC voltage drop across the resistor. (This test should be performed with the power switch in both the On and Off positions.)



A reading of 0.35 volt RMS or more is excessive and indicates a potential shock hazard which must be corrected before returning the unit to the owner.

CONTROLS AND FUNCTIONS



❶ POWER SWITCH
Press to turn unit on and off.

❷ EJECT
Press to load and remove tape cassette.

❸ COUNTER
Indicates tape position in minutes and seconds.

❹ REC PLAY
Displays operating mode: Record, Play, Rewind or Fast Forward.

❺ LEVEL
Shows signal level.

❻ TAPE I II IV
Automatically indicates type of tape in use.

❼ DOLBY B C
Shows if Dolby B or C circuits are on.

❽ DOLBY * NR
Activates Dolby Noise Reduction Circuitry for playing or recording tapes.

❾ MPX FILTER
Press when recording FM stereo broadcasts using Dolby noise reduction.

❿ COUNTER RESET
Resets Tape Counter to 00:00.

⓫ RECORD/PAUSE
Puts cassette deck in Record ready or pause mode.

⓬ BIAS FINE TRIM
Adjusts bias when recording.

⓭ PLAY
Begins playback or recording.

⓮ STOP
Stops tape transport in any mode.

⓯ REWIND/FAST FORWARD
Rapidly rewinds or advances tape.

⓰ B/C
Selects Dolby B or Dolby C Noise Reduction.

⓱ BALANCE
Adjusts balance between left and right channels when recording.

⓲ RECORD MUTE
Inserts blank space when recording.

⓳ INPUT LEVEL
Adjusts recording level.

*** NOTE**
Dolby noise reduction manufactured under license from Dolby Laboratories Licensing Corporation.

"DOLBY" and the double-D symbol ⧈ are trademarks of Dolby Laboratories Licensing Corporation.

DISASSEMBLY PROCEDURES (REFER TO PAGES 9, 10 AND 11)

[1] CABINET TOP (133) REMOVAL

Remove 4 screws (A) and 2 screws (B), then remove the Cabinet Top (133).

[2] FRONT PANEL ASSEMBLY (AA) REMOVAL

1. Remove the Cabinet Top (133). (Refer to step 1.)
2. Remove the Plate with window (140 and 143).
3. Disconnect CN801, CN901 and CN902 connected to the Main P. C. Board (PCB-1).
4. Remove 3 Rotary Knobs (147 and 151) and the Nut.
5. Remove 7 screws (C) and then remove the Front Panel Assembly (AA).

[3] CASSETTE TAPE RECORDER MECHANISM ASSEMBLY REMOVAL

1. Remove the Front Panel Assembly (AA). (Refer to step 2.)
2. Disconnect LCN801, LCN802 and LCN803 connected to the Cassette Tape Recorder Mechanism Assembly.
3. Disconnect CN101 and CN301 connected to the Main P. C. Board (PCB-1).
4. Remove the spring (179).
5. Remove 6 screws (D) and then remove the Cassette Tape Recorder Mechanism Assembly.

[4] MAIN P. C. BOARD (PCB-1) REMOVAL

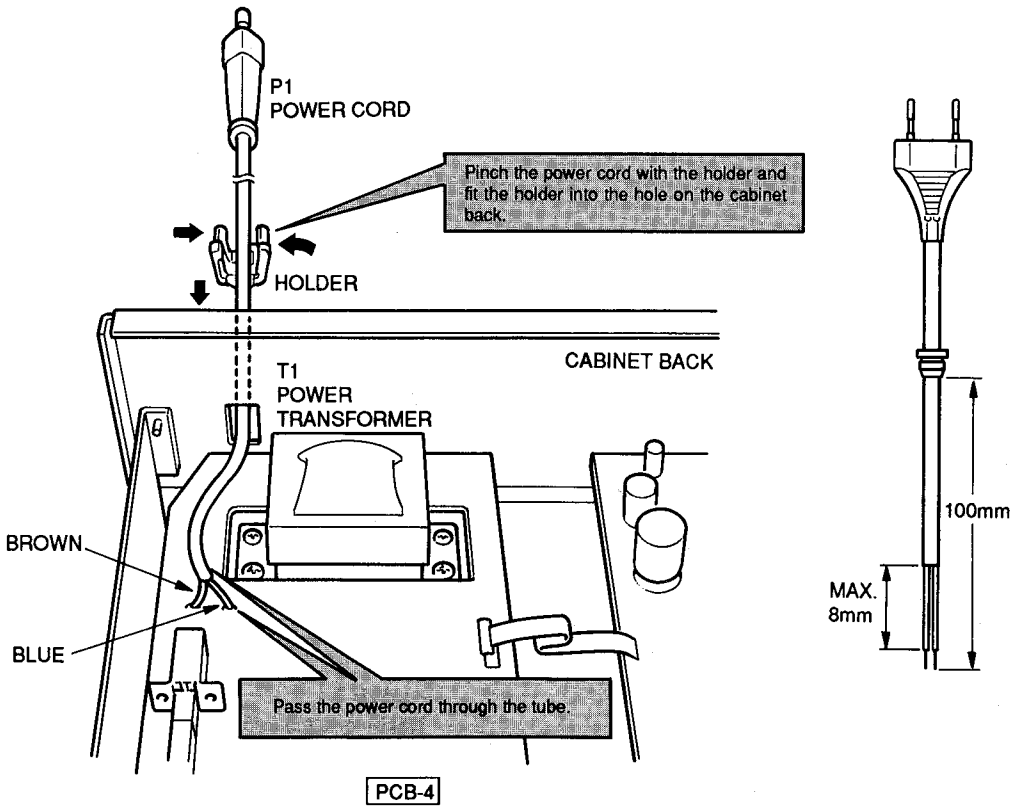
1. Remove the Cabinet Top (133). (Refer to step 1.)
2. Disconnect CN101 and CN301 connected to the Cassette Tape Recorder Mechanism Assembly.
3. Disconnect CN102 and CN103 connected to the Front P. C. Board (PCB-2).
4. Disconnect JL101 connected to the Power P. C. Board (PCB-4).
5. Remove the screw (E) and the metal fitting (164).
6. Disconnect CN501, CN502 and CN503 and then remove the Dolby NR P. C. Board (PCB-3) from the Main P. C. Board (PCB-1).
7. Remove 8 screws (F), then remove the Main P. C. Board (PCB-1).

[5] OTHER P. C. BOARDS REMOVAL

1. Remove the Front Panel Assembly (AA). (Refer to step 2.)
2. Remove 8 screws (G) and 3 screws (H), then remove the Front P. C. Board (PCB-2).
3. Remove 4 screws (I) and then remove the Power P. C. Board (PCB-4). If necessary, disconnect the connector.

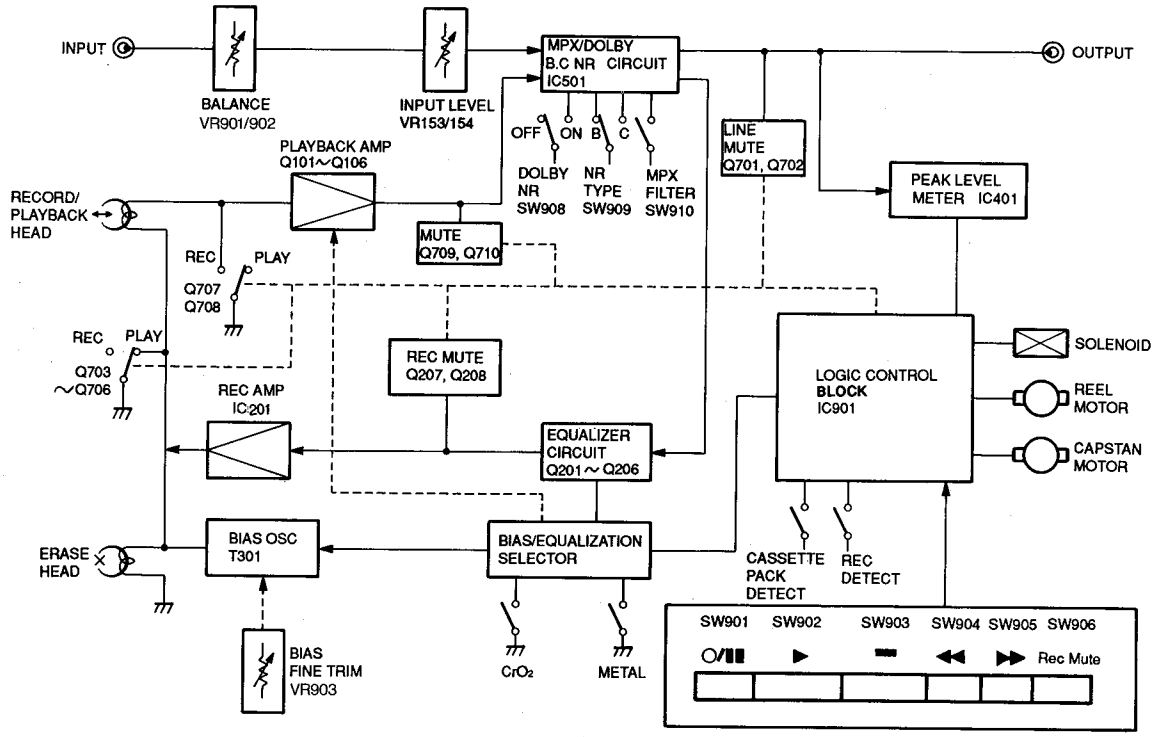
POWER CORD REPLACEMENT (FOR SERVICE ENGINEERS OTHER THAN NORTH AMERICA)

In order to prevent fire or shock hazard when replacing the power cord, follow the Procedure below to replace the part with the standard supply parts.



PCB-4

BLOCK DIAGRAM



CIRCUIT DESCRIPTION

PLAYBACK SIGNAL

The signal from the playback head is amplified by the playback amplifier Q101, Q103 and Q105 (L ch.), and is applied to the pins 2 (L ch.) and 29 (R ch.) of the Dolby NR IC501 (B/C type). Switching of the playback signal from the record mode (external input signal) to the playback mode is performed inside IC501.

IC501 is usually switched to the playback mode. However, the control signal transmitted to the pin 5 of IC501 from IC901 through Q505 and Q506 switches IC501 from the record mode to the playback mode. The input signal to IC501 is output from the pins 6 (L ch.) and 25 (R ch.) and applied to the OUTPUT jack and the PEAK LEVEL METER circuit. The characteristics of the playback equalizer are defined by the BIAS/EQUALIZATION switch and are selected and specified in Q107 (L ch.) and Q108 (R ch.)

RECORD SIGNAL

The signal from the INPUT jack is controlled by the INPUT LEVEL control and BALANCE control and is applied to pins 1 (L ch.) and 30 (R ch.) of the Dolby NR IC501 (B/C type). Switching of the record signal from the playback mode to the record mode is performed inside IC501. The control signal transmitted to the pin 5 of IC501 from IC901 through Q505 and Q506 switches IC501 from the playback mode to the record mode.

The input signal to the Dolby NR IC is output from pins 3 (L ch.) and 28 (R ch.) of IC501 and passes through the MPX filter. Then it is input to the pins 4 (L ch.) and 27 (R ch.) and is output from the pins 7 (L ch.) and 24 (R ch.). The signal output from IC501 passes through the record equalizer circuit and is amplified by the record amplifier of IC201. The amplified signal is then applied to the recording head after being synthesized by a bias signal.

MUTING OPERATION

The signal that mutes the sound produced at switching to recording or playback is applied from IC901 of the logic control block.

When the "STOP" button is pressed, the mute signal output from the pin 28 of IC901 turns ON Q701 (L ch.) and Q702 (R ch.) to short-circuit the output signals of the playback amplifiers for muting. For the purpose of preventing generation of noise at power ON/OFF, the mute signal is output from Q51. The muting is done by short circuiting the output signal with Q701 (L ch.) and Q702 (R ch.) turned ON.

LOGIC FOR RECORD MODE

When the "REC" button is pressed, the pin 27 of IC901 becomes high level and Q709 (L ch.) and Q710 (R ch.) turn ON. The input to the Dolby NR IC is muted. Also Q713 and Q712 turn ON and Q711 turns OFF. Therefore Q703, Q705 (L ch.) and Q704, Q706 (R ch.) turn OFF to release the muting of the outputs from the record amplifiers.

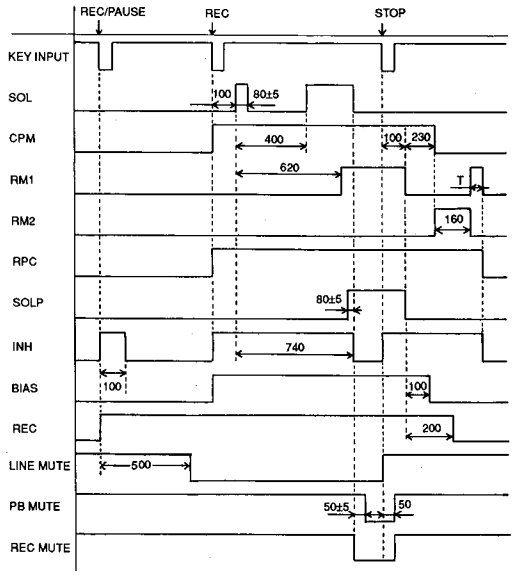
Also, Q505 turns ON and Q506 turns OFF to make the pin 5 of IC501 high level. Therefore the mode is switched to the record mode.

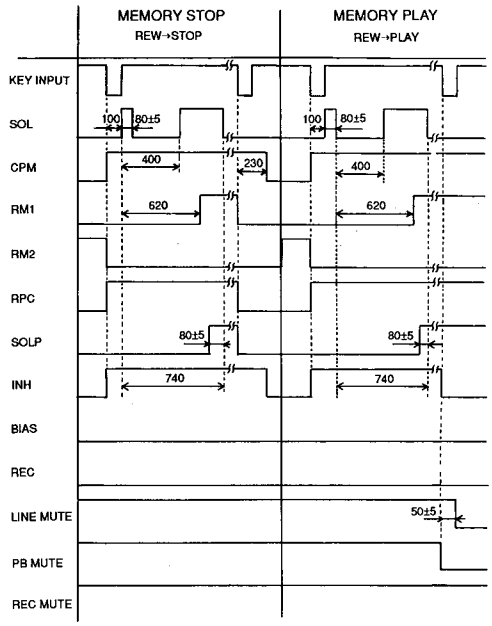
LOGIC FOR RECORD TO PLAYBACK MODE

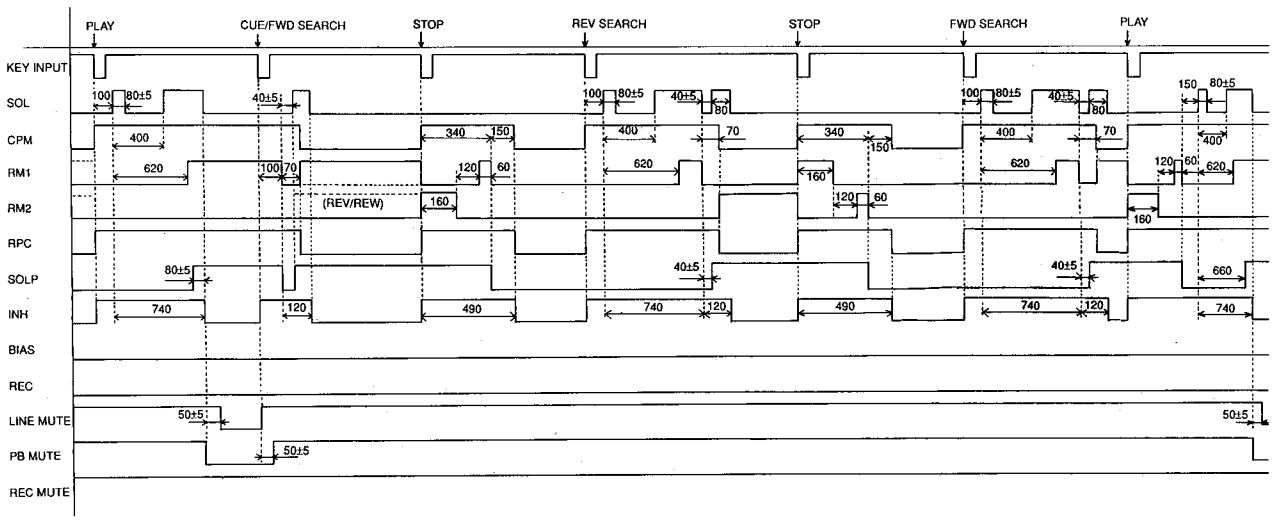
When the "STOP", "PAUSE" or "PLAY" button is pressed, the pin 26 of IC901 becomes high level. Q215 turns ON and Q208 (L ch.), Q207 (R ch.) turn ON to mute the inputs to the record amplifiers. Also, Q713 and Q714 turn OFF and Q711 turns ON to turn ON Q703, Q705 (L ch.) and Q704, Q706 (R ch.). Therefore the outputs from the record amplifiers are muted.

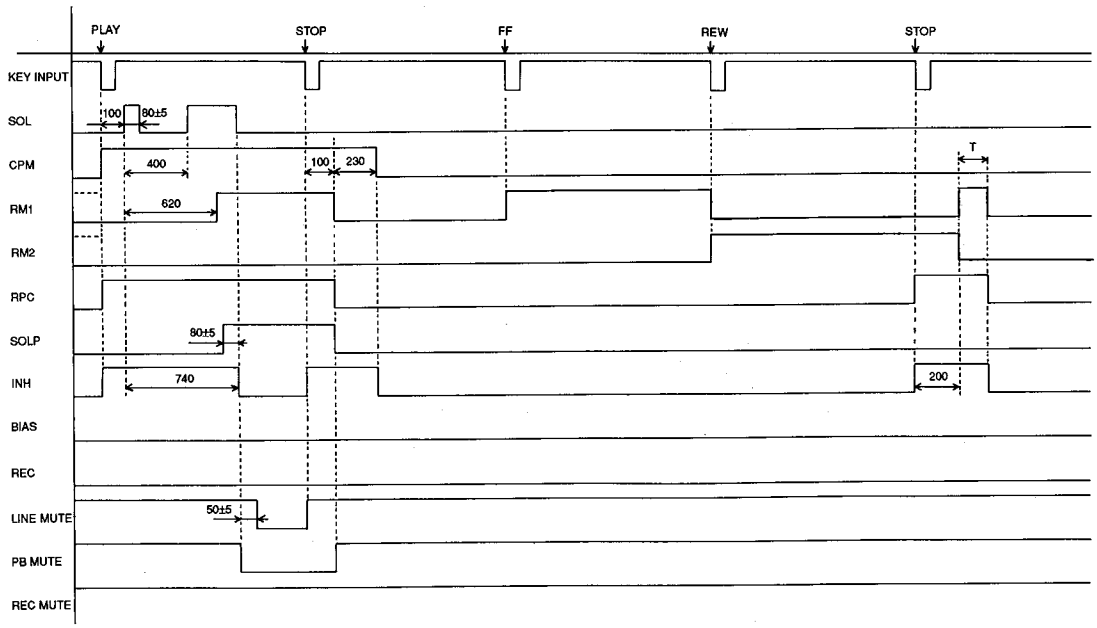
Also, Q505 turns OFF and Q506 turns ON to make the pin 5 of IC501 low level. Therefore the mode is switched to the playback mode.

TIMING CHART









ALIGNMENT PROCEDURES (REFER TO PAGES 12, 13, 18 AND 19)

■ CASSETTE MECHANISM CONFIRMATION

Make sure to confirm conditons of the cassette mechanism as follows before adjustment.

1. Confirmation of erase prevention function

- The switch should turn ON when a tape with erroneous erase preventive pawl is inserted. (Use a tape which is 0.2mm smaller than the minimum size of 62.9mm or a MAZ-0184-C gauge one.)

2. Confirmation of cassette pack detection function

- The switch should turn ON when a tape is inserted. (Use a tape whose minimum size is 63.5mm or a MAZ-0184-C gauge one.)
- When the switch arm is moved back gradually from the ON position, the switch should turn OFF.

3. Confirmation of eject function

- The cassette compartment opens smoothly and no abnormal noise should be heard while opening and closing.
- The eject lock arm opens smoothly without contacting the chassis and damper.
- The eject button can not be pressed during playback.

4. Confirmation of playback, fast forward and rewind functions

- The torque used in each of the playback, fast forward and rewind modes should be within specification.
  - Playback ..... 35gr.cm~70gr.cm
  - FastForward ..... 70gr.cm~150gr.cm
  - Rewind ..... 70gr.cm~150gr.cm
- No abnormal noise should be heard during operation in any mode. The solenoid switching sound should not be considered as a noise.

5. Confirmation of positions of record/playback head and erase head

- Head height
  a) Set the M-300 head gauge.
  b) Set the unit in the playback mode and place the adjustment chip on the head gauge as shown in the Fig. 1.
  c) The adjustment chip should not contact the tape guide of both record/playback head and erase head.

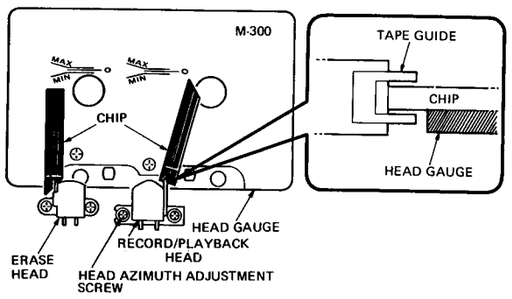


Fig. 1

- Head position
  a) Set the M-300 head gauge.
  b) Set the unit in the playback mode and place the adjustment chip on the head gauge as shown in the Fig. 2.
  c) With both record/playback head and erase head, the adjustment chip should be between MIN and MAX of the M-300 head gauge.

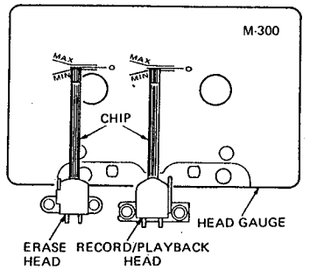


Fig. 2

■ ELECTRICAL ADJUSTMENT AND CONFIRMATION

1. Before adjustment

- Before electrical adjustment, make sure that confirmations of the cassette mechanism are all completed.
- After the power switch is pushed on, wait for 10 minutes before measuring to be sure of the most stable operation.
- Since head magnetization, dust accumulations, etc. are likely to introduce errors in the various characteristics, it is very important that the heads are properly demagnetized and cleaned before commencing any adjustment, particularly frequency response and head azimuth adjustment.

2. Instruments required

- Low frequency oscillator
- AC VTVM or dual channel AC VTVM
- Oscilloscope
- Wow/flutter meter
- Frequency counter
- Distortion meter

3. Test tapes

- Azimuth adjustment ..... MTT-114 or TCC-153
- Tape speed adjustment ..... MTT-111DN or TCC-112
- Playback output level adjustment ..... TCC-130 or MTT-150
- Playback frequency characteristic confirmation ..... TCC-1216 or TCC-162C and TCC-262C
- Reference tapes
  LN SCC-502
  CrO_2 ..... SCC-1360
  METAL SCC-565

Note:

C-90 differes with C-60 in the thickness and bias is of unequal, so adjust with the tape whose bias in of specified value.

4. General conditions (unless otherwise noted)

Controls and Switches	Settings
Dolby NR	Off
Input Level	Maximum
MPX Filter	Off
Bias Fine Trim	Center
Balance	Center

Azimuth Adjustment

When the maximum level point of R channel does not equal that L channel, connect the oscilloscope as shown in Fig. 3 and proceed with azimuth adjustment so that L and R channels are in phase.

a) Connect L channel tape out to "X (or V)" and R channel to "Y (or H)". Observe the lissajouss waveform.
b) Set L and R channels to monaural. Adjust vertical and horizontal gain so that the waveform becomes 45 degree.
c) Adjust azimuth so that the measurement of "a" becomes maximum and the measurement of "b" becomes minimum against the 45 degree line.

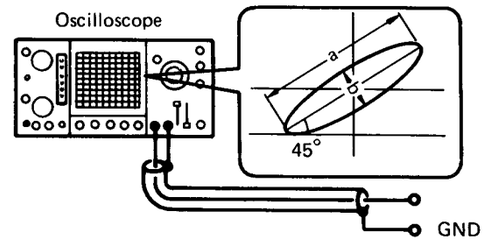


Fig. 3

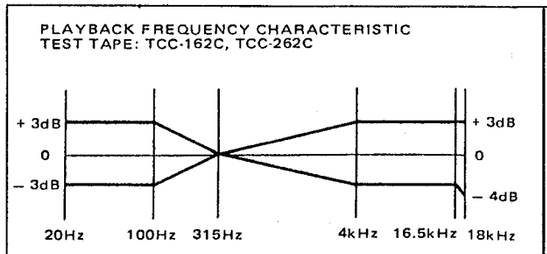


Fig. a

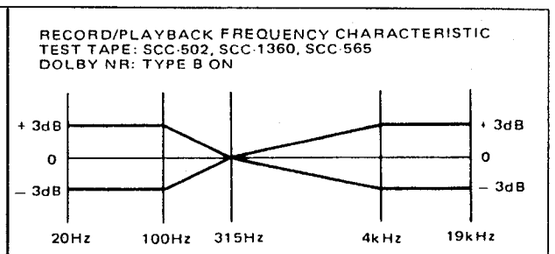


Fig. c

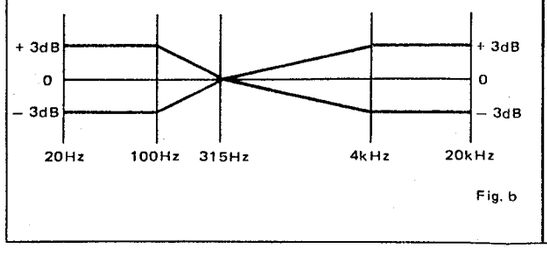


Fig. b

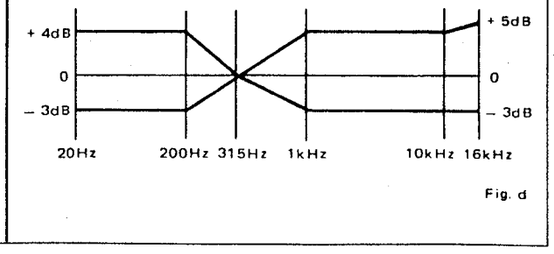


Fig. d

ALIGNMENT PROCEDURES (REFER TO PAGES 12, 13, 18 AND 19)

■ CASSETTE MECHANISM CONFIRMATION

Make sure to confirm conditons of the cassette mechanism as follows before adjustment.

1. Confirmation of erase prevention function

- The switch should turn ON when a tape with erroneous erase preventive pawl is inserted. (Use a tape which is 0.2mm smaller than the minimum size of 62.9mm or a MAZ-0184-C gauge one.)

2. Confirmation of cassette pack detection function

- The switch should turn ON when a tape is inserted. (Use a tape whose minimum size is 63.5mm or a MAZ-0184-C gauge one.)
- When the switch arm is moved back gradually from the ON position, the switch should turn OFF.

3. Confirmation of eject function

- The cassette compartment opens smoothly and no abnormal noise should be heard while opening and closing.
- The eject lock arm opens smoothly without contacting the chassis and damper.
- The eject button can not be pressed during playback.

4. Confirmation of playback, fast forward and rewind functions

- The torque used in each of the playback, fast forward and rewind modes should be within specification.
  - Playback ..... 35gr.cm~70gr.cm
  - FastForward ..... 70gr.cm~150gr.cm
  - Rewind ..... 70gr.cm~150gr.cm
- No abnormal noise should be heard during operation in any mode. The solenoid switching sound should not be considered as a noise.

5. Confirmation of positions of record/playback head and erase head

- Head height
  a) Set the M-300 head gauge.
  b) Set the unit in the playback mode and place the adjustment chip on the head gauge as shown in the Fig. 1.
  c) The adjustment chip should not contact the tape guide of both record/playback head and erase head.

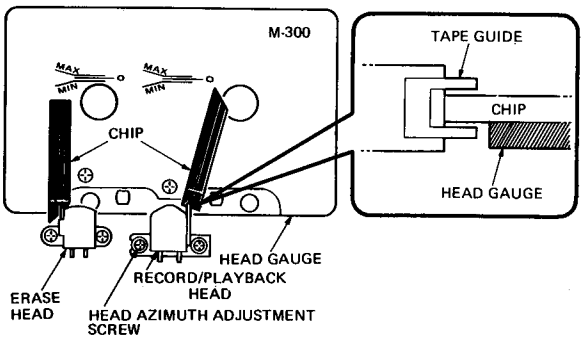


Fig. 1

- Head position
  a) Set the M-300 head gauge.
  b) Set the unit in the playback mode and place the adjustment chip on the head gauge as shown in the Fig. 2.
  c) With both record/playback head and erase head, the adjustment chip should be between MIN and MAX of the M-300 head gauge.

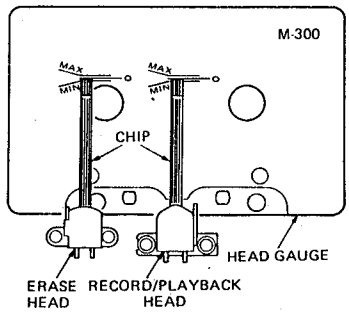


Fig. 2

■ ELECTRICAL ADJUSTMENT AND CONFIRMATION

1. Before adjustment

- Before electrical adjustment, make sure that confirmations of the cassette mechanism are all completed.
- After the power switch is pushed on, wait for 10 minutes before measuring to be sure of the most stable operation.
- Since head magnetization, dust accumulations, etc. are likely to introduce errors in the various characteristics, it is very important that the heads are properly demagnetized and cleaned before commencing any adjustment, particularly frequency response and head azimuth adjustment.

2. Instruments required

- Low frequency oscillator
- AC VTVM or dual channel AC VTVM
- Oscilloscope
- Wow/flutter meter
- Frequency counter
- Distortion meter

3. Test tapes

- Azimuth adjustment ..... MTT-114 or TCC-153
- Tape speed adjustment ..... MTT-111DN or TCC-112
- Playback output level adjustment ..... TCC-130 or MTT-150
- Playback frequency characteristic confirmation ..... TCC-1216 or TCC-162C and TCC-262C
- Reference tapes
  LN SCC-502
  CrO_2 ..... SCC-1360
  METAL SCC-565

Note:
C-90 differes with C-60 in the thickness and bias is of unequal, so adjust with the tape whose bias in of specified value.

4. General conditions (unless otherwise noted)

Controls and Switches	Settings
Dolby NR	Off
Input Level	Maximum
MPX Filter	Off
Bias Fine Trim	Center
Balance	Center

Azimuth Adjustment

When the maximum level point of R channel does not equal that L channel, connect the oscilloscope as shown in Fig. 3 and proceed with azimuth adjustment so that L and R channels are in phase.

a) Connect L channel tape out to "X (or V)" and R channel to "Y (or H)". Observe the lissajouss waveform.
b) Set L and R channels to monaural. Adjust vertical and horizontal gain so that the waveform becomes 45 degree.
c) Adjust azimuth so that the measurement of "a" becomes maximum and the measurement of "b" becomes minimum against the 45 degree line.

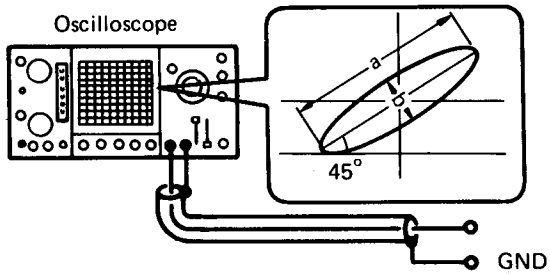


Fig. 3

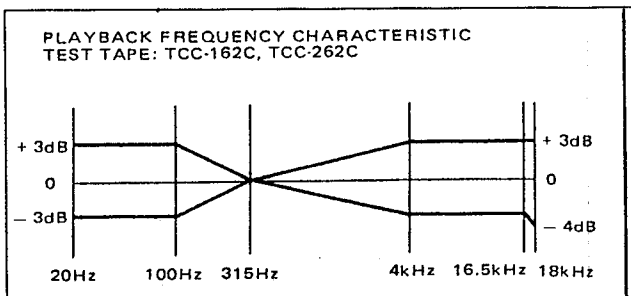


Fig. a

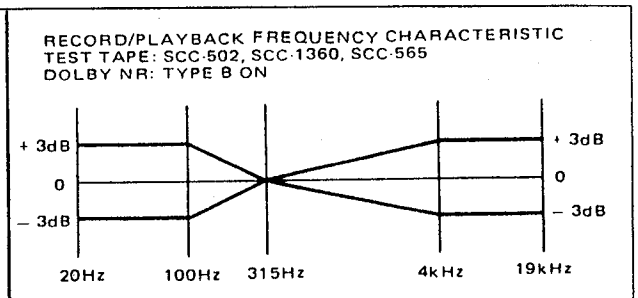


Fig. c

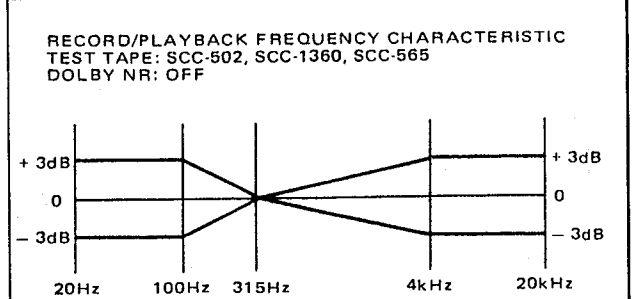


Fig. b

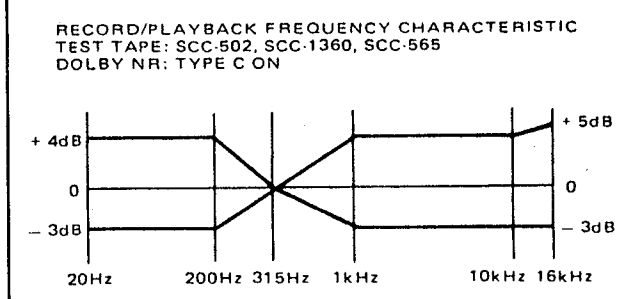
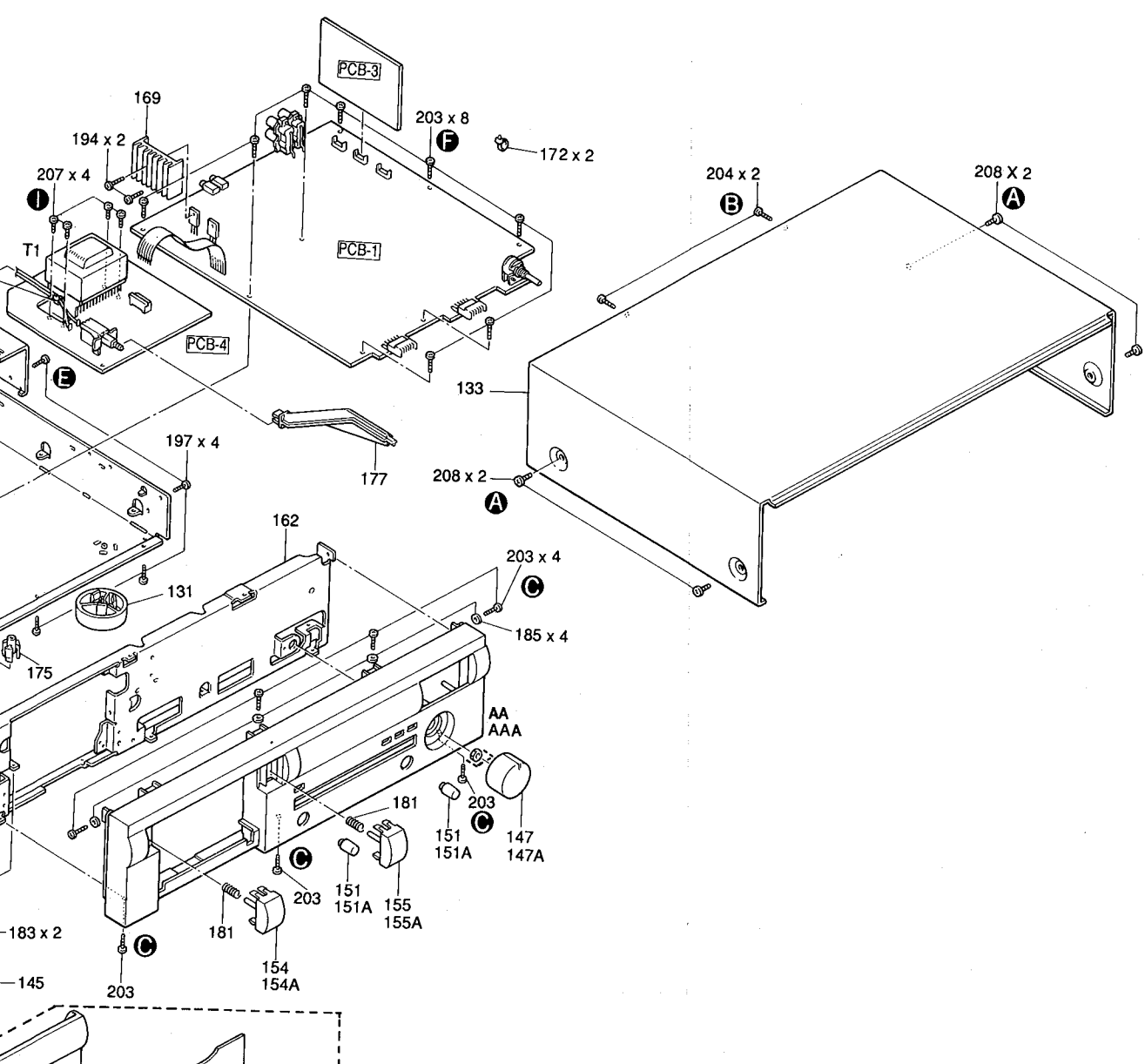


Fig. d

Step	Alignment	Instrument Required	Input Signal	Mode	Test Point	Adjustment	For
1	Azimuth	VTVM Oscilloscope Test tape (MTT-114 or TCC-153)		PB	TP501 (Lch), GND TP502 (Rch), GND or OUTPUT jack	Azimuth screw	Maximum output Refer to "Azimuth Adjustment" on page 7.
2	Tape speed	Frequency counter Test tape (MTT-111DN or TCC-112)		PB	TP501 (Lch), GND TP502 (Rch), GND	VR (built in motor)	3000Hz ± 10Hz Adjust at the center of test tape.
3	Playback output level	VTVM Test tape (TCC-130 or MTT-150)		PB	TP501 (Lch), GND TP502 (Rch), GND	VR101 (Lch) VR102 (Rch)	775mV Tape selector is LN position.
4	Playback frequency characteristic confirmation	VTVM Test tape (TCC-1216 or TCC-162C and TCC-262C)		PB	TP501 (Lch), GND TP502 (Rch), GND or OUTPUT jack	R129, R130 R131, R132 R133, R134	Unsolder resistors of R129 and R130, R131 and R132 or R133 and R134 so that the frequency response is within the range as shown in Fig. a.
5	Bias frequency confirmation	Frequency counter		REC/PB	TP101 (Lch), GND TP102 (Rch), GND	T301	105kHz ± 3kHz Tape selector is METAL position.
6-1	Bias level (pre-adjustment)	VTVM		REC/PB	TP101 (Lch), GND TP102 (Rch), GND	VR301 VR302	85mV Tape selector is METAL position.
6-2						VR305	55mV Tape selector is CrO_2 position.
6-3						VR304	33mV Tape selector is LN position.
7	Bias trap	VTVM		REC/PB	TP201 (Rch), GND TP202 (Lch), GND	LC201, LC202	Minimum output Tape selector is METAL position.
8	Record level (pre-adjustment)	VTVM Blank tapes CrO_2 SCC-1360 METAL SCC-565 LN SCC-502	Apply 1kHz signal to INPUT jack. Set INPUT LEVEL knob so that TP501 and TP502 to GND voltage is 775mV in REC-PAUSE mode.	REC/PB	TP501 (Lch), GND TP502 (Rch), GND	VR201, VR202 VR301, VR302	775mV Tape selector is METAL position. Adjust VR301 and VR302 so that the distortioon becomes 1.1%~1.4%
						VR304 VR305	775mV Adjust VR303 and VR304 so that the distortion becomes 1.3% (CrO_2). Adjust VR305 and VR306 so that the distortion becomes 1.0% (LN). This confirmation should be at each tape selector position.
9-1	Record/playback equalizer frequency characteristic	VTVM Blank tapes CrO_2 SCC-1360 METAL SCC-565 LN SCC-502	Apply 1kHz signal to INPUT jack. Set INPUT LEVEL knob so that TP501 and TP502 to GND voltage is 25dB below 775mV in REC-PAUSE mode. Then adjust with a 20Hz to 30kHz sweep signal.	REC/PB	OUTPUT jack	VR305 L201, L202 (VR301, VR302)	So that the record/playback frequency response is flat (at least within the range in Fig. b). Tape selector is CrO_2 position.
9-2						VR301 VR302	So that the record/playback frequency response is flat (at least within the range in Fig. b). Tape selector is METAL position.
9-3						VR304 L201, L202 (VR301, VR302)	So that the record/playback frequency response is flat (at least within the range in Fig. b). Tape selector is LN position.
10	Record level	VTVM Blank tapes CrO_2 SCC-1360 METAL SCC-565 LN SCC-502	Set INPUT LEVEL knob so that TP501 and TP502 to GND voltage is 775mV in REC-PAUSE mode.	REC/PB	TP501 (Lch), GND TP502 (Rch), GND	VR201 VR202	775mV Perform adjustment using CrO_2. Perform checking only for LN and METAL tapes.
11	Meter level	VTVM	Apply 1kHz signal to INPUT jack. Set INPUT LEVEL knob so that TP501 and TP502 to GND voltage is 1.5dB below 775mV.	REC-PAUSE	PEAK LEVEL METER	VR401 VR402	Confirm peak level meter reads: –1 dB.
12	MPX filter characteristic confirmation	VTVM	Apply 19kHz, 15kHz and 1kHz signal to INPUT jack. Set INPUT LEVEL knob so that TP501 and TP502 to GND voltage is 775mV.	REC-PAUSE MPX filter ON	TP501 (Lch), GND TP502 (Rch), GND or OUTPUT jack	LC501 LC502	Adjust for -0.3 dB at 15kHz and >30 dB at 19kHz.
13	Record/playback equalizer frequency characteristic confirmation	VTVM Blank tapes CrO_2 SCC-1360 METAL SCC-565 LN SCC-502	Apply 1kHz signal to INPUT jack. Set INPUT LEVEL knob so that TP501 and TP502 to GND voltage is 25dB below 775mV in REC-PAUSE mode. Then adjust with a 20Hz to 30kHz sweep signal.	REC/PB	OUTPUT jack		Perform checking with Dolby B and C NR ON at each tape selector position. Confirm the record/playback frequency characteristic is within ± 3 dB at 20Hz to 20 kHz.

Step	Alignment	Instrument Required	Input Signal	Mode
1	Azimuth	VTVM Oscilloscope Test tape (MTT-114 or TCC-153)		PB
2	Tape speed	Frequency counter Test tape (MTT-111DN or TCC-112)		PB
3	Playback output level	VTVM Test tape (TCC-130 or MTT-150)		PB
4	Playback frequency characteristic confirmation	VTVM Test tape (TCC-1216 or TCC-162C and TCC-262C)		PB
5	Bias frequency confirmation	Frequency counter		REC/PB
6-1 6-2 6-3	Bias level (pre-adjustment)	VTVM		REC/PB
7	Bias trap	VTVM		REC/PB
8	Record level (pre-adjustment)	VTVM Blank tapes CrO_2 SCC-1360 METAL SCC-565 LN SCC-502	Apply 1kHz signal to INPUT jack. Set INPUT LEVEL knob so that TP501 and TP502 to GND voltage is 775mV in REC-PAUSE mode.	REC/PB
9-1 9-2 9-3	Record/playback equalizer frequency characteristic	VTVM Blank tapes CrO_2 SCC-1360 METAL SCC-565 LN SCC-502	Apply 1kHz signal to INPUT jack. Set INPUT LEVEL knob so that TP501 and TP502 to GND voltage is 25dB below 775mV in REC-PAUSE mode. Then adjust with a 20Hz to 30kHz sweep signal.	REC/PB
10	Record level	VTVM Blank tapes CrO_2 SCC-1360 METAL SCC-565 LN SCC-502	Set INPUT LEVEL knob so that TP501 and TP502 to GND voltage is 775mV in REC-PAUSE mode.	REC/PB
11	Meter level	VTVM	Apply 1kHz signal to INPUT jack. Set INPUT LEVEL knob so that TP501 and TP502 to GND voltage is 1.5dB below 775mV.	REC-PAUSE
12	MPX filter characteristic confirmation	VTVM	Apply 19kHz, 15kHz and 1kHz signal to INPUT jack. Set INPUT LEVEL knob so that TP501 and TP502 to GND voltage is 775mV.	REC-PAUSE MPX filte ON
13	Record/playback equalizer frequency characteristic confirmation	VTVM Blank tapes CrO_2 SCC-1360 METAL SCC-565 LN SCC-502	Apply 1kHz signal to INPUT jack. Set INPUT LEVEL knob so that TP501 and TP502 to GND voltage is 25dB below 775mV in REC-PAUSE mode. Then adjust with a 20Hz to 30kHz sweep signal.	REC/PB

Mode	Test Point	Adjustment	For
PB	TP501 (Lch), GND TP502 (Rch), GND or OUTPUT jack	Azimuth screw	Maximum output Refer to "Azimuth Adjustment" on page 7.
PB	TP501 (Lch), GND TP502 (Rch), GND	VR (built in motor)	3000Hz ± 10Hz Adjust at the center of test tape.
PB	TP501 (Lch), GND TP502 (Rch), GND	VR101 (Lch) VR102 (Rch)	775mV Tape selector is LN position.
PB	TP501 (Lch), GND TP502 (Rch), GND or OUTPUT jack	R129, R130 R131, R132 R133, R134	Unsolder resistors of R129 and R130, R131 and R132 or R133 and R134 so that the frequency response is within the range as shown in Fig. a.
REC/PB	TP101 (Lch), GND TP102 (Rch), GND	T301	105kHz ± 3kHz Tape selector is METAL position.
REC/PB	TP101 (Lch), GND TP102 (Rch), GND	VR301 VR302	85mV Tape selector is METAL position.
		VR305	55mV Tape selector is CrO_2 position.
		VR304	33mV Tape selector is LN position.
REC/PB	TP201 (Rch), GND TP202 (Lch), GND	LC201, LC202	Minimum output Tape selector is METAL position.
REC/PB	TP501 (Lch), GND TP502 (Rch), GND	VR201, VR202 VR301, VR302	775mV Tape selector is METAL position. Adjust VR301 and VR302 so that the distortioon becomes 1.1%~1.4%
		VR304 VR305	775mV Adjust VR303 and VR304 so that the distortion becomes 1.3% (CrO_2). Adjust VR305 and VR306 so that the distortion becomes 1.0% (LN). This confirmation should be at each tape selector position.
REC/PB	OUTPUT jack	VR305 L201, L202 (VR301, VR302)	So that the record/playback frequency response is flat (at least within the range in Fig. b). Tape selector is CrO_2 position.
		VR301 VR302	So that the record/playback frequency response is flat (at least within the range in Fig. b). Tape selector is METAL position.
		VR304 L201, L202 (VR301, VR302)	So that the record/playback frequency response is flat (at least within the range in Fig. b). Tape selector is LN position.
REC/PB	TP501 (Lch), GND TP502 (Rch), GND	VR201 VR202	775mV Perform adjustment using CrO_2. Perform checking only for LN and METAL tapes.
REC- PAUSE	PEAK LEVEL METER	VR401 VR402	Confirm peak level meter reads: –1 dB.
REC- PAUSE MPX filter ON	TP501 (Lch), GND TP502 (Rch), GND or OUTPUT jack	LC501 LC502	Adjust for -0.3 dB at 15kHz and >30 dB at 19kHz.
REC/PB	OUTPUT jack		Perform checking with Dolby B and C NR ON at each tape selector position. Confirm the record/playback frequency characteristic is within ± 3 dB at 20Hz to 20 kHz.



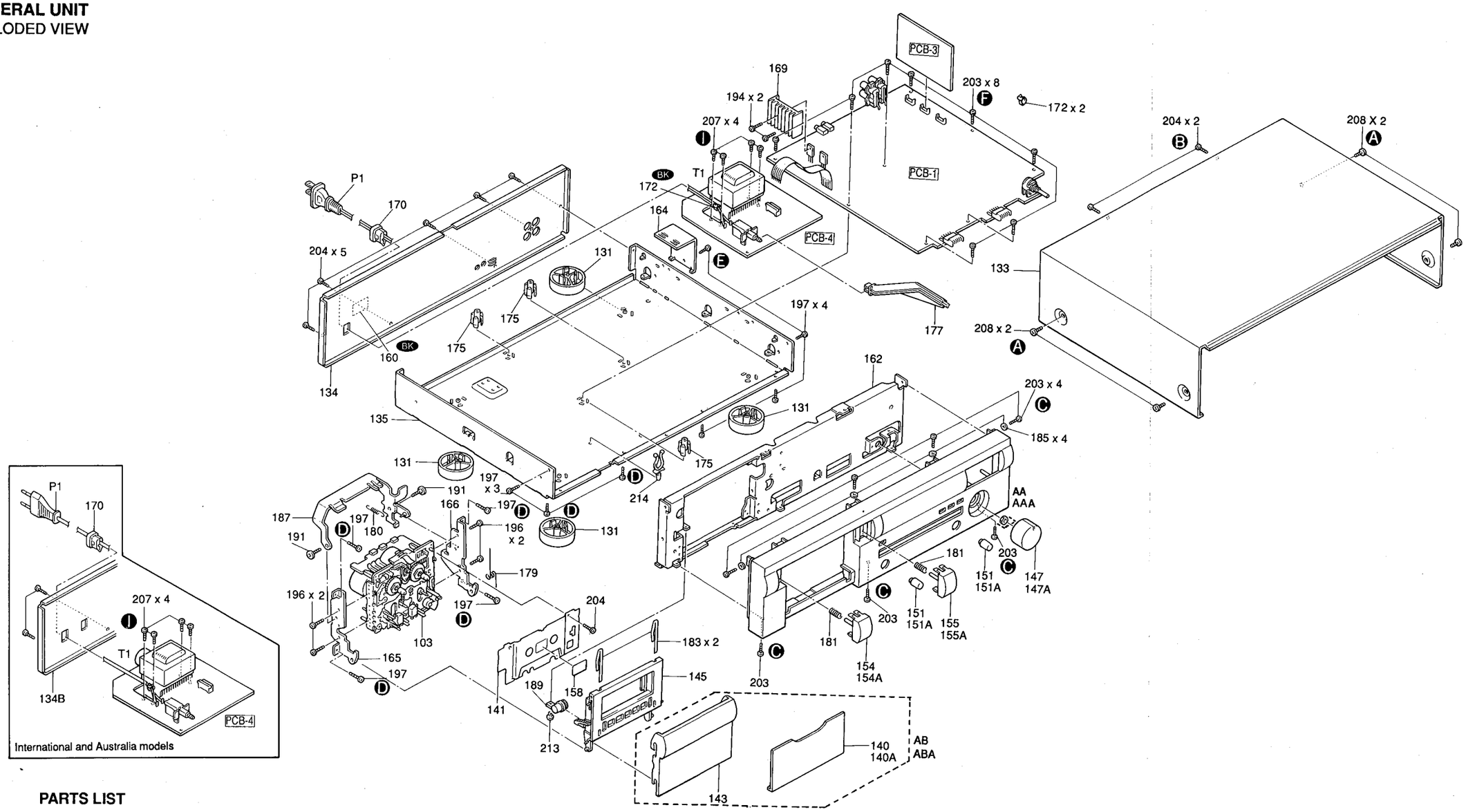
Ref. No.	Part No.	Description
166	2219-8287	METAL FITTING
169	2222-7281	HEAT SINK
170	2240-364	HOLDER
172	2240-R0101	HOLDER
175	2360-7022	BOSS
177	2601-7192	SHAFT
179	2651-047	SPRING
180	2651-11212	SPRING, LEVER
181	2651-2101732	SPRING
183	2652-105	LEAF SPRING
185	2411-30Z1	WASHER, PLAIN
187	2672-7043	LEVER
189	2692-016	DAMPER
191	2320-044	SCREW
194	2327-R0130082	SCREW (3 x 8mm)

Ref. No.	Part No.	Description
196	2347-260527	SCREW (2.6 x 5mm)
197	2347-R0130062	SCREW (3 x 6mm)
203	2347-R0130082	SCREW (3 x 8mm)
204	2347-R0130084	SCREW (3 x 8mm)
207	2347-R0140062	SCREW (4 x 6mm)
208	2347-R0140064	SCREW (4 x 6mm)
213	2459-3005511	RIVET, PLASTIC
214	2240-7049	HOLDER
⚠ P1	4161-71151	CORD W/PLUG BK
⚠ P1	4161-7256	CORD W/PLUG I IB G GB
⚠ P1	4161-04100	CORD W/PLUG BB
⚠ T1	5584-S8201	XFORMER, POWER BK
⚠ T1	5584-S8202	XFORMER, POWER I IB G GB BB

NOTE

⚠ SAFETY RELATED COMPONENT. USE ONLY EXACT REPLACEMENT PART AS SPECIFIED.

GENERAL UNIT
EXPLODED VIEW



PARTS LIST

Ref. No.	Part No.	Description
AA	A442-TD4200A	FRONT PANEL ASS'Y I G
AAA	A442-TD4200B	FRONT PANEL ASS'Y BK IB GB BB
AB	A512-TD4200A	PLATE ASS'Y I G
ABA	A512-TD4200B	PLATE ASS'Y BK IB GB BB
103	3112-15901	CASSETTE TAPE RECORDER MECHANISM ASS'Y
131	1319-03301	LEG
133	1414-15901	CABINET, TOP COVER
134	1424-31601	CABINET BACK, REAR BK
134B	1424-31605	CABINET BACK, REAR I IB G GB BB
135	1424-31701	CABINET BACK, BOTTON
140	1512-06805	PLATE I G
140A	1512-06801	PLATE BK IB GB BB
141	1514-23201	PLATE
143	1532-19501	WINDOW

Ref. No.	Part No.	Description
145	1612-07401	CASSETTE LID
147	1630-04302	ROTARY KNOB I G
147A	1630-04301	ROTARY KNOB BK IB GB BB
151	1632-20402	ROTARY KNOB I G
151A	1632-20401	ROTARY KNOB BK IB GB BB
154	1662-58403	PUSH BUTTON I G
154A	1662-58401	PUSH BUTTON BK IB GB BB
155	1662-58404	PUSH BUTTON I G
155A	1662-58402	PUSH BUTTON BK IB GB BB
158	1741-01601	ORNAMENT
160	1756-CSA	LABEL BK
162	2211-7311	CHASSIS
164	2219-8285	METAL FITTING
165	2219-8286	METAL FITTING

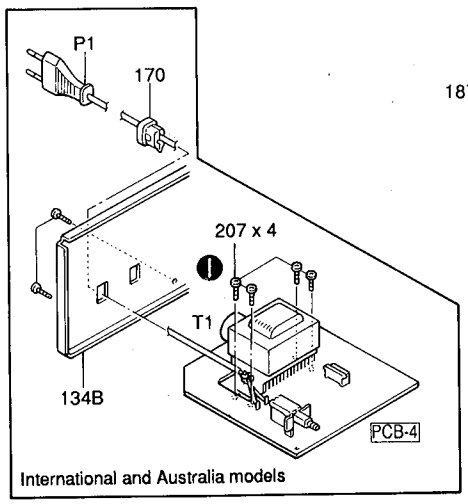
Ref. No.	Part No.	Description
166	2219-8287	METAL FITTING
169	2222-7281	HEAT SINK
170	2240-364	HOLDER
172	2240-R0101	HOLDER
175	2360-7022	BOSS
177	2601-7192	SHAFT
179	2651-047	SPRING
180	2651-11212	SPRING, LEVER
181	2651-2101732	SPRING
183	2652-105	LEAF SPRING
185	2411-30Z1	WASHER, PLAIN
187	2672-7043	LEVER
189	2692-016	DAMPER
191	2320-044	SCREW
194	2327-R0130082	SCREW (3 x 8mm)

Ref. No.	Part No.	Description
196	2347-260527	SCREW (2.6 x 5mm)
197	2347-R0130062	SCREW (3 x 6mm)
203	2347-R0130082	SCREW (3 x 8mm)
204	2347-R0130084	SCREW (3 x 8mm)
207	2347-R0140062	SCREW (4 x 6mm)
208	2347-R0140064	SCREW (4 x 6mm)
213	2459-3005511	RIVET, PLASTIC
214	2240-7049	HOLDER
⚠ P1	4161-71151	CORD W/PLUG BK
⚠ P1	4161-7256	CORD W/PLUG I IB G GB
⚠ P1	4161-04100	CORD W/PLUG BB
⚠ T1	5584-S8201	XFORMER, POWER BK
⚠ T1	5584-S8202	XFORMER, POWER I IB G GB BB

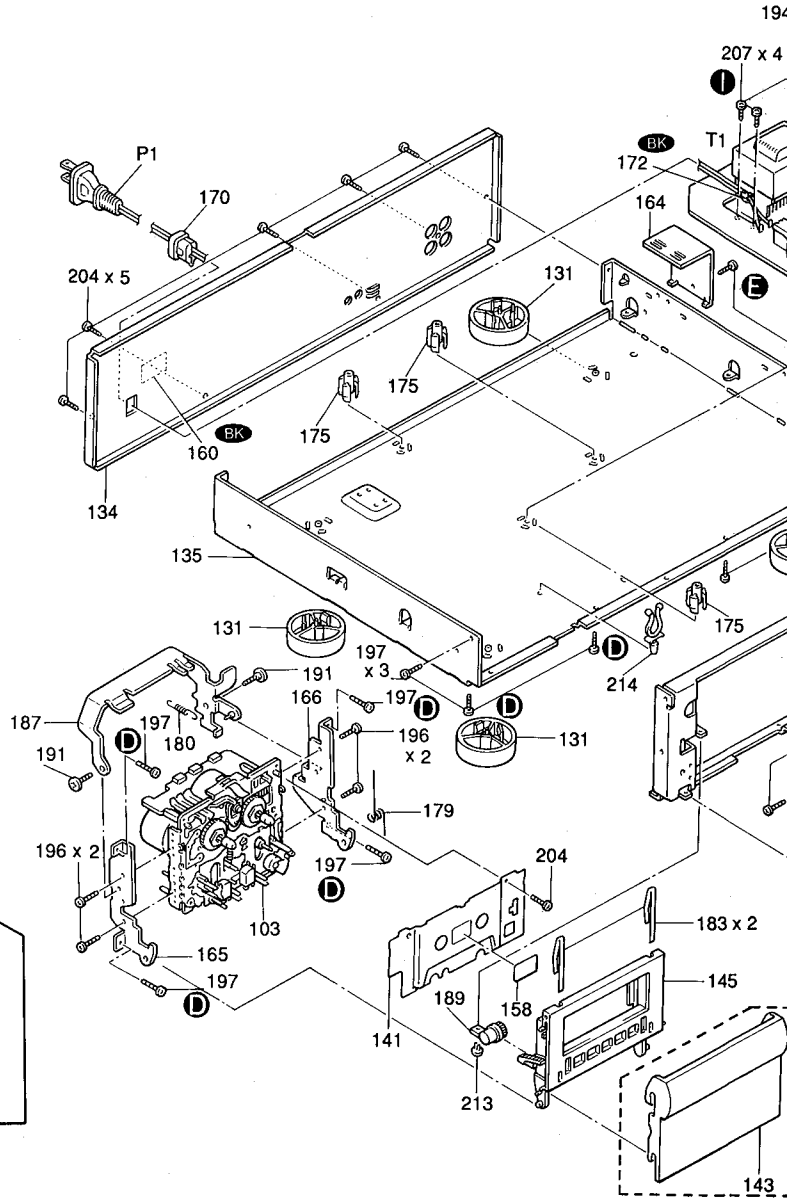
NOTE

⚠ SAFETY RELATED COMPONENT. USE ONLY EXACT REPLACEMENT PART AS SPECIFIED.

GENERAL UNIT
EXPLODED VIEW



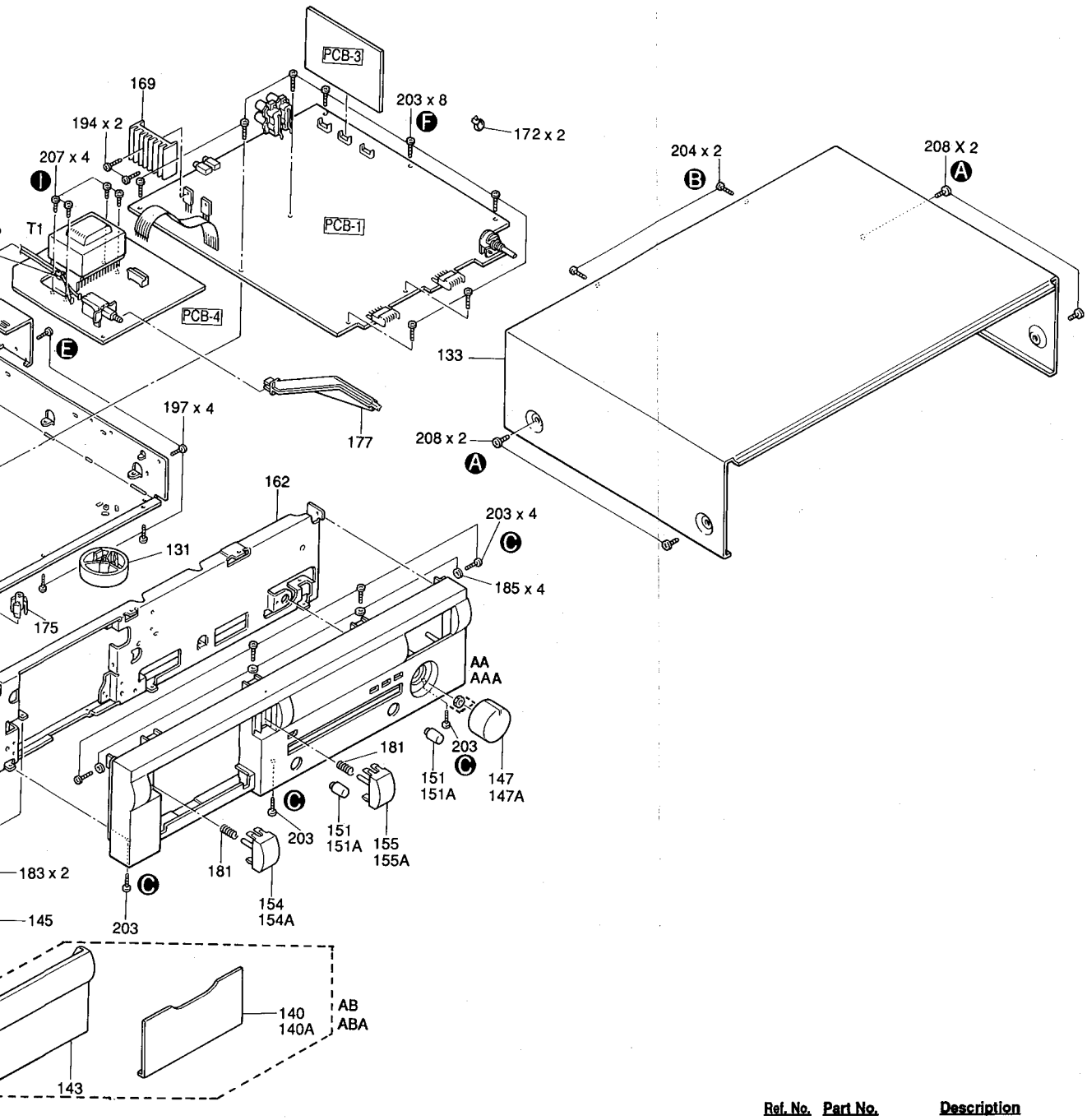
International and Australia models



PARTS LIST

Ref. No.	Part No.	Description
AA	A442-TD4200A	FRONT PANEL ASS'Y I G
AAA	A442-TD4200B	FRONT PANEL ASS'Y BK IB GB BB
AB	A512-TD4200A	PLATE ASS'Y I G
ABA	A512-TD4200B	PLATE ASS'Y BK IB GB BB
103	3112-15901	CASSETTE TAPE RECORDER MECHANISM ASS'Y
131	1319-03301	LEG
133	1414-15901	CABINET, TOP COVER
134	1424-31601	CABINET BACK, REAR BK
134B	1424-31605	CABINET BACK, REAR I IB G GB BB
135	1424-31701	CABINET BACK, BOTTON
140	1512-06805	PLATE I G
140A	1512-06801	PLATE BK IB GB BB
141	1514-23201	PLATE
143	1532-19501	WINDOW

Ref. No.	Part No.	Description
145	1612-07401	CASSETTE LID
147	1630-04302	ROTARY KNOB I G
147A	1630-04301	ROTARY KNOB BK IB GB BB
151	1632-20402	ROTARY KNOB I G
151A	1632-20401	ROTARY KNOB BK IB GB BB
154	1662-58403	PUSH BUTTON I G
154A	1662-58401	PUSH BUTTON BK IB GB BB
155	1662-58404	PUSH BUTTON I G
155A	1662-58402	PUSH BUTTON BK IB GB BB
158	1741-01601	ORNAMENT
160	1756-CSA	LABEL BK
162	2211-7311	CHASSIS
164	2219-8285	METAL FITTING
165	2219-8286	METAL FITTING



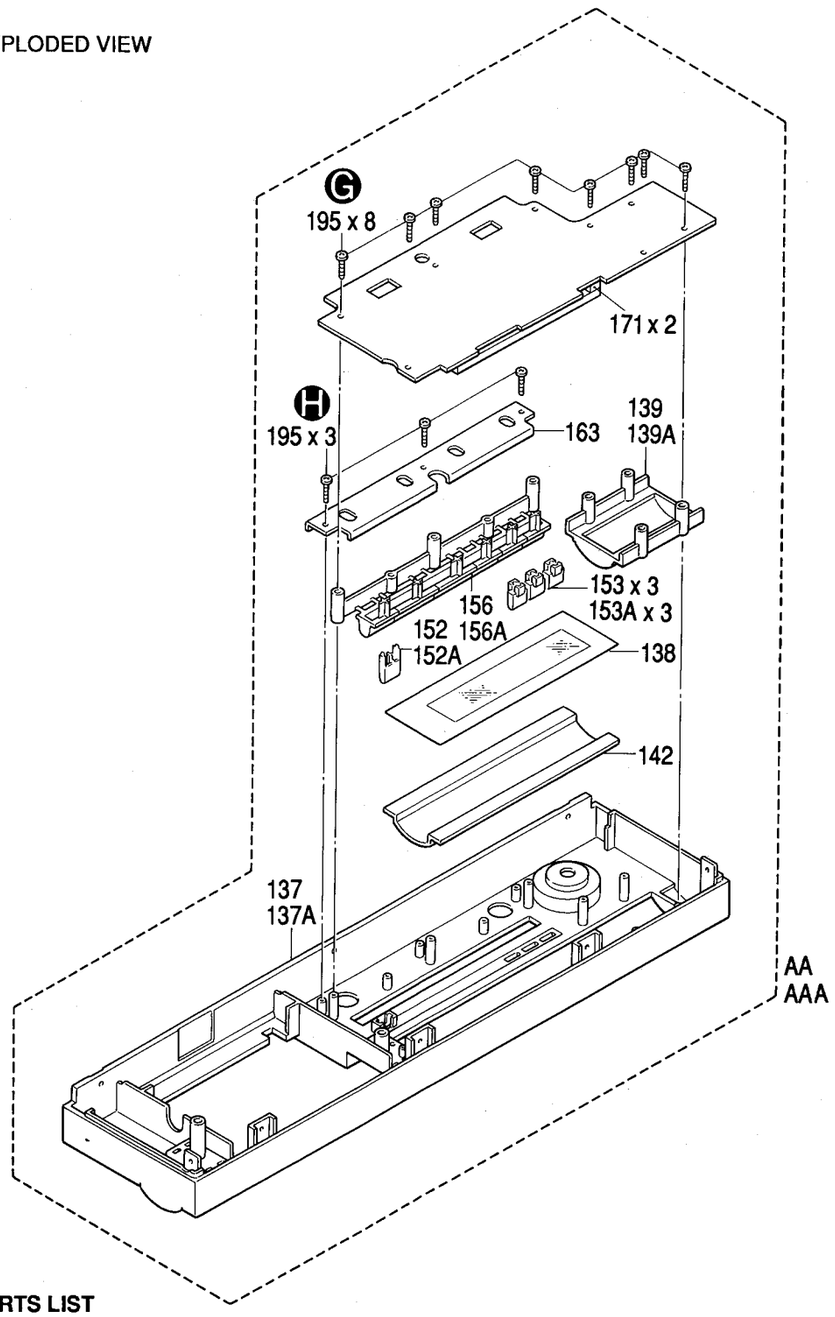
Ref. No.	Part No.	Description
166	2219-8287	METAL FITTING
169	2222-7281	HEAT SINK
170	2240-364	HOLDER
172	2240-R0101	HOLDER
175	2360-7022	BOSS
177	2601-7192	SHAFT
179	2651-047	SPRING
180	2651-11212	SPRING, LEVER
181	2651-2101732	SPRING
183	2652-105	LEAF SPRING
185	2411-30Z1	WASHER, PLAIN
187	2672-7043	LEVER
189	2692-016	DAMPER
191	2320-044	SCREW
194	2327-R0130082	SCREW (3 x 8mm)

Ref. No.	Part No.	Description
196	2347-260527	SCREW (2.6 x 5mm)
197	2347-R0130062	SCREW (3 x 6mm)
203	2347-R0130082	SCREW (3 x 8mm)
204	2347-R0130084	SCREW (3 x 8mm)
207	2347-R0140062	SCREW (4 x 6mm)
208	2347-R0140064	SCREW (4 x 6mm)
213	2459-3005511	RIVET, PLASTIC
214	2240-7049	HOLDER
⚠ P1	4161-71151	CORD W/PLUG BK
⚠ P1	4161-7256	CORD W/PLUG I IB G GB
⚠ P1	4161-04100	CORD W/PLUG BB
⚠ T1	5584-S8201	XFORMER, POWER BK
⚠ T1	5584-S8202	XFORMER, POWER I IB G GB BB

NOTE

⚠ SAFETY RELATED COMPONENT. USE ONLY EXACT REPLACEMENT PART AS SPECIFIED.

EXPLODED VIEW

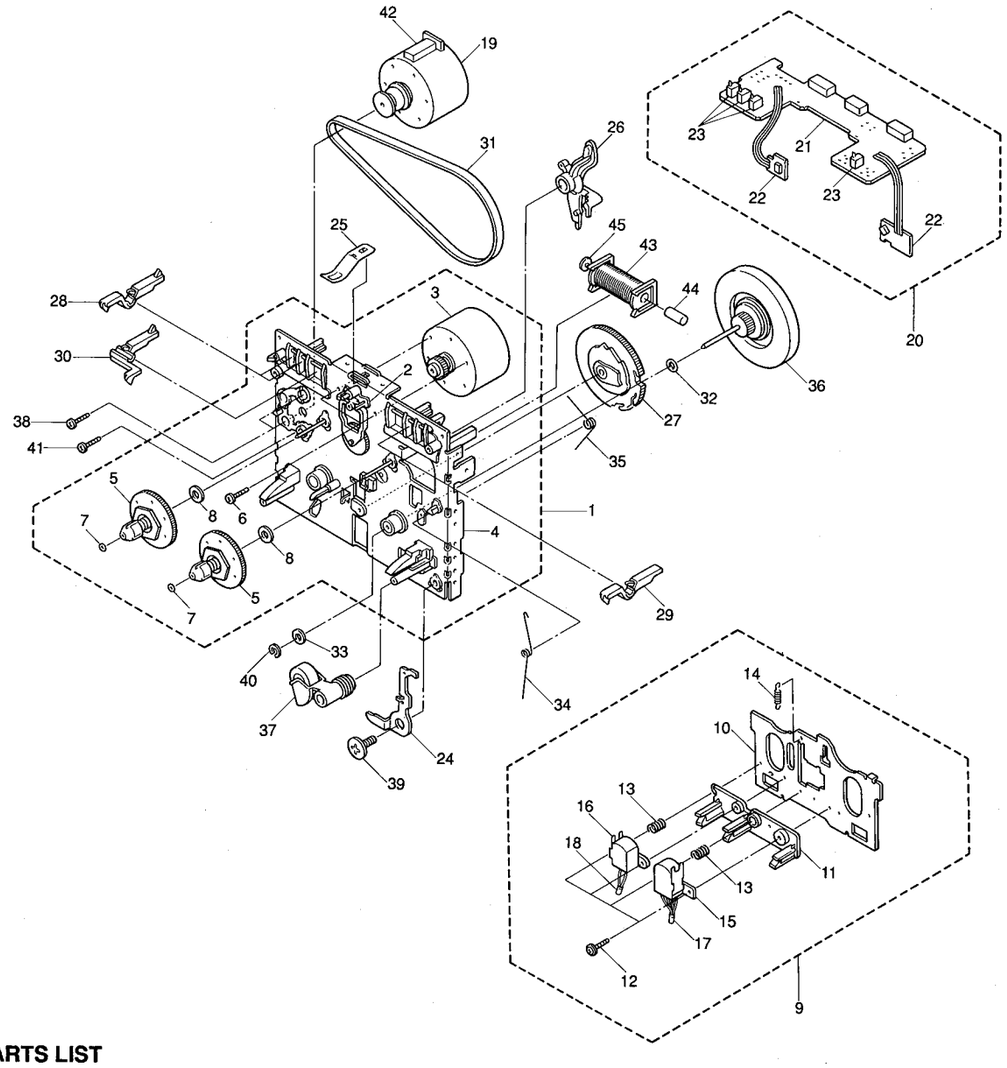


PARTS LIST

Ref. No.	Part No.	Description
AA	A442-TD4200A	FRONT PANEL ASS'Y I G
AAA	A442-TD4200B	FRONT PANEL ASS'Y BK IB GB BB
137	1442-24406	PANEL I G
137A	1442-24401	PANEL BK IB GB BB
138	1511-19806	PLATE
139	1512-06702	PLATE I G
139A	1512-06701	PLATE BK IB GB BB
142	1532-17504	WINDOW
152	1662-36303	PUSH BUTTON I G
152A	1662-36301	PUSH BUTTON BK IB GB BB
153	1662-52303	PUSH BUTTON I G
153A	1662-52301	PUSH BUTTON BK IB GB BB
156	1662-58502	PUSH BUTTON I G
156A	1662-58501	PUSH BUTTON BK IB GB BB
163	2219-8284	METAL FITTING
171	2240-7370	HOLDER
195	2347-R0126082	SCREW

CASSETTE TAPE RECORDER MECHANISM

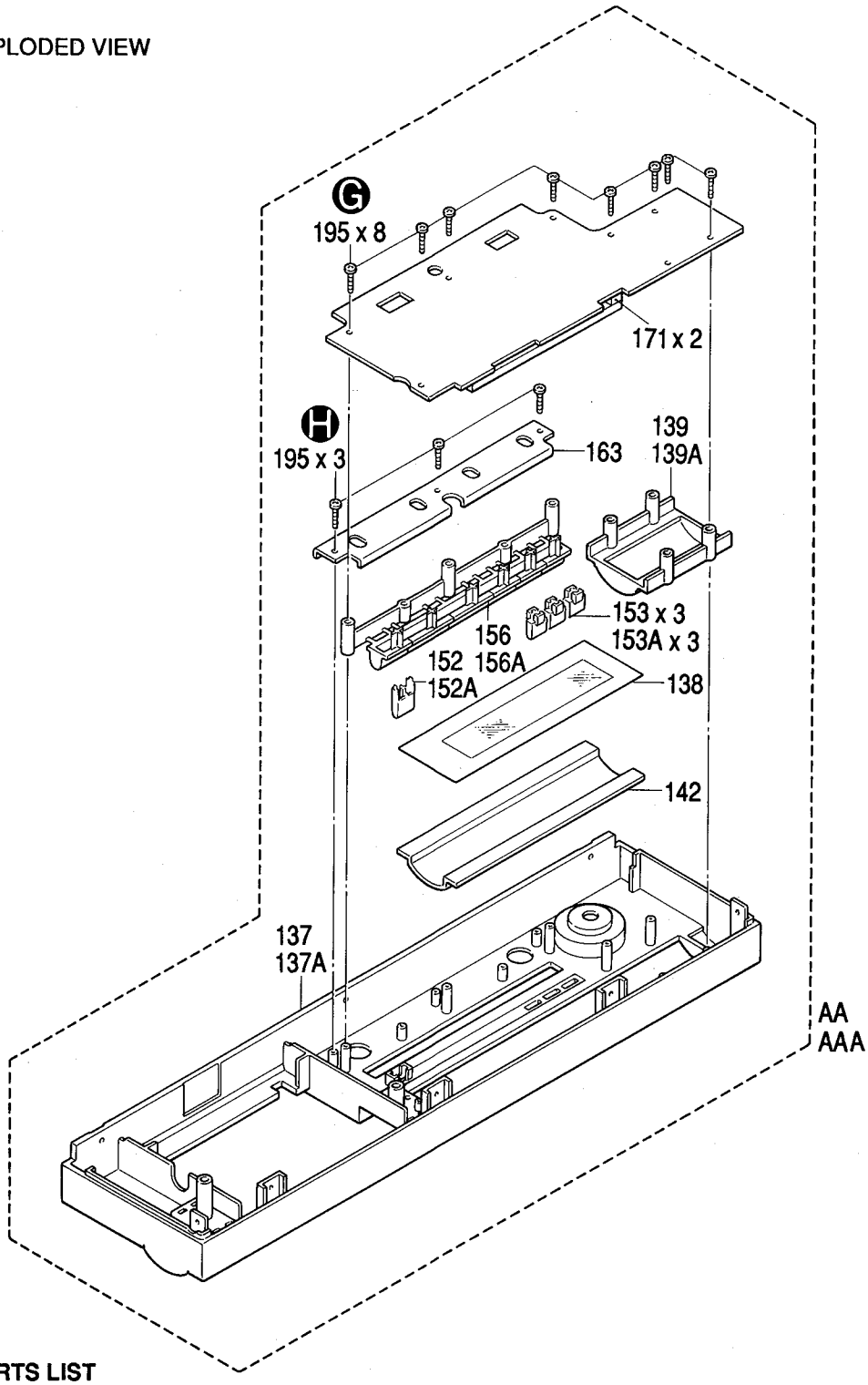
EXPLODED VIEW



PARTS LIST

Ref. No.	Part No.	Description
1	F511-481	CHASSIS ASS'Y
2	F517-049	IDLER ASS'Y
3	F564-280	REEL MOTOR ASS'Y
4	F612-164	CHASSIS BASE ASS'Y
5	F623-037	REEL BASE ASS'Y
6	FG156-11A	SCREW (2.6 x 6.4 mm)
7	FJ111-17	NON-METAL WASHER (1.7 x 0.25 mm)
8	UJ12V-11	NON-METAL WASHER (2.1 x 0.25 mm)
9	F513-594	PLATE HEAD ASS'Y
10	FC52E-44	HEAD BASE
11	FD45T-15	HEAD SPACER
12	FG137-18	SCREW (2.0 x 9 mm)
13	FK21U-11	SPRING, AZIMUTH
14	FK26N-14	HEAD BASE SPRING
15	FU16B-11	REC/PB HEAD
16	FU192-11	ERASE HEAD
17	WH50S-06	WIRE CONNECTOR
18	WH42S-00	WIRE CONNECTOR
19	F525-269	CAPSTAN MOTOR
20	F567-362	RELAY P.C. BOARD ASS'Y
21	F743-103	RELAY P.C. BOARD
22	AZ15S-00	LEAF SWITCH
23	UE16E-11	PUSH SWITCH
24	FC39M-68	EJECT PREVENTION ARM
25	FC52H-12	SPRING, CASSETTE
26	FD45G-12	PLAY ARM ASS'Y
27	FD45B-14	CAM GEAR
28	FD44T-14	SWITCH ARM, REC
29	FD44Y-12	SWITCH ARM, PACK
30	FD44V-12	SWITCH ARM, METAL
31	FF17W-21	MAIN BELT
32	FJ111-30	NON-METAL WASHER (2.6 x 0.25 mm)
33	FJ111-14	NON-METAL WASHER (2.6 x 0.5 mm)
34	FK28L-16	EJECT PREVENTION SPRING
35	FK28R-11	SLIDE SPRING
36	FR22D-11	FLYWHEEL ASS'Y
37	FR20L-21A	PINCH ROLLER
38	FG114-14	SCREW (2.6 x 5 mm)
39	UG15S-11A	SCREW (7.7 mm)
40	UG13U-15	E-STOP, RING
41	UG12H-16	SCREW (3.0 x 8 mm)
42	FF17C-12	HOLDER CUSHION
43	F765-263	SOLENOID ASS'Y
44	FL39H-12A	SHAFT
45	FL39K-12	PLUNGER

EXPLODED VIEW



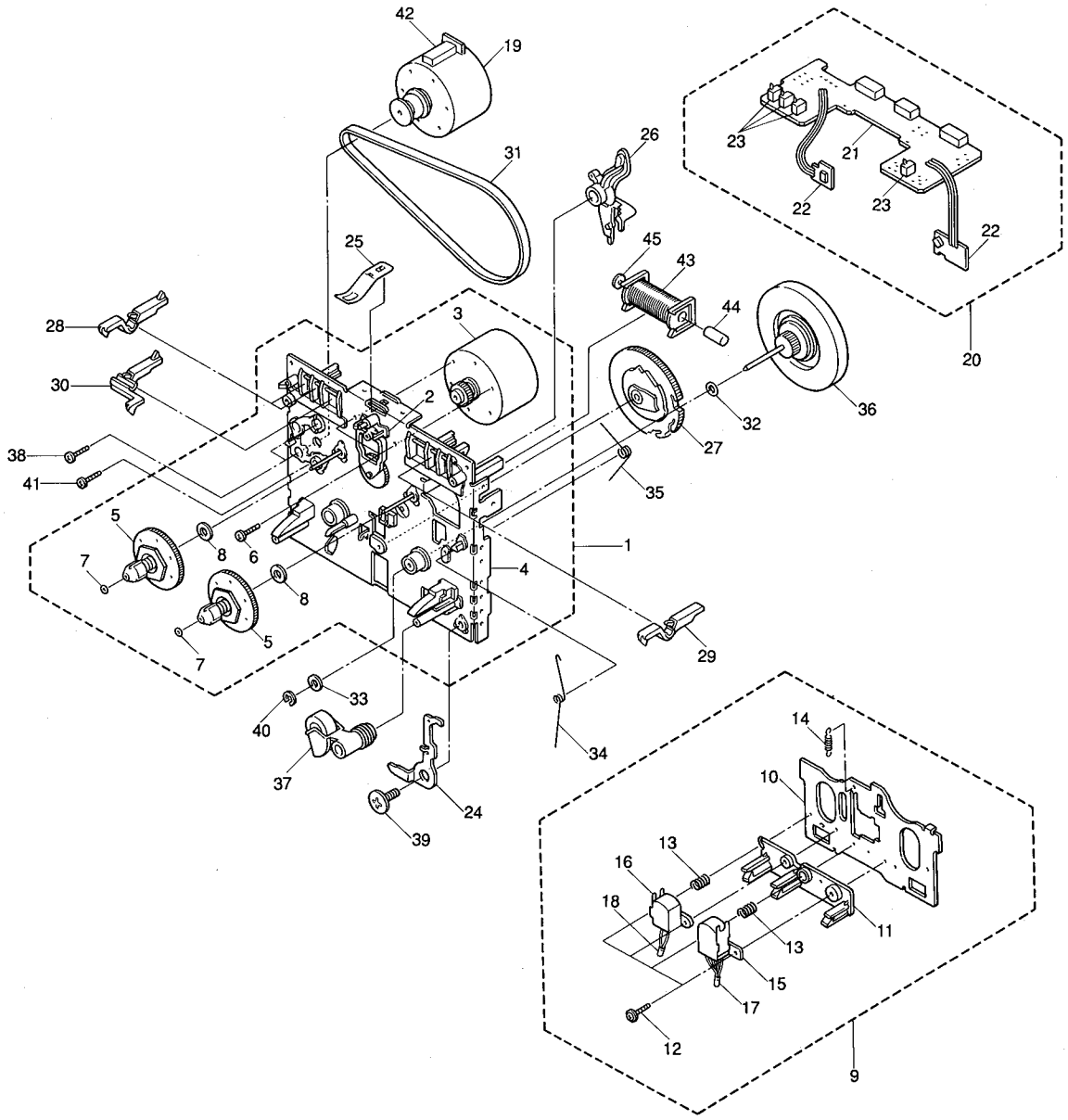
PARTS LIST

Ref. No.	Part No.	Description
AA	A442-TD4200A	FRONT PANEL ASS'Y (I) (G)
AAA	A442-TD4200B	FRONT PANEL ASS'Y (BK) (IB) (GB) (BB)
137	1442-24406	PANEL (I) (G)
137A	1442-24401	PANEL (BK) (IB) (GB) (BB)
138	1511-19806	PLATE
139	1512-06702	PLATE (I) (G)
139A	1512-06701	PLATE (BK) (IB) (GB) (BB)
142	1532-17504	WINDOW
152	1662-36303	PUSH BUTTON (I) (G)

Ref. No.	Part No.	Description
152A	1662-36301	PUSH BUTTON (BK) (IB) (GB) (BB)
153	1662-52303	PUSH BUTTON (I) (G)
153A	1662-52301	PUSH BUTTON (BK) (IB) (GB) (BB)
156	1662-58502	PUSH BUTTON (I) (G)
156A	1662-58501	PUSH BUTTON (BK) (IB) (GB) (BB)
163	2219-8284	METAL FITTING
171	2240-7370	HOLDER
195	2347-R0126082	SCREW

CASSETTE TAPE RECORDER MECHANISM

EXPLODED VIEW

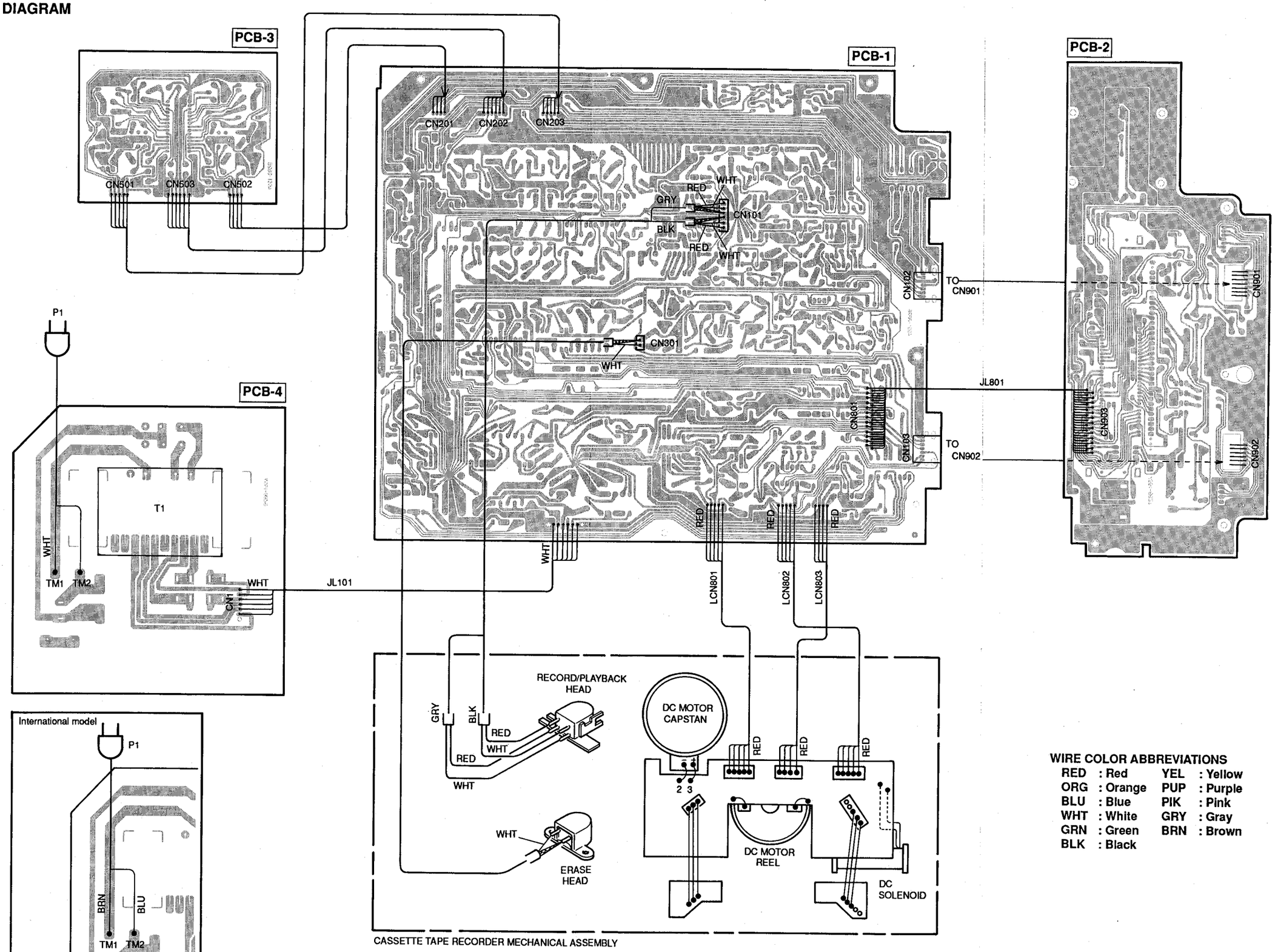


PARTS LIST

Ref. No.	Part No.	Description
1	F511-481	CHASSIS ASS'Y
2	F517-049	IDLER ASS'Y
3	F564-280	REEL MOTOR ASS'Y
4	F612-164	CHASSIS BASE ASS'Y
5	F623-037	REEL BASE ASS'Y
6	FG156-11A	SCREW (2.6 x 6.4 mm)
7	FJ111-17	NON-METAL WASHER (1.7 x 0.25 mm)
8	UJ12V-11	NON-METAL WASHER (2.1 x 0.25 mm)
9	F513-594	PLATE HEAD ASS'Y
10	FC52E-44	HEAD BASE
11	FD45T-15	HEAD SPACER
12	FG137-18	SCREW (2.0 x 9 mm)
13	FK21U-11	SPRING, AZIMUTH
14	FK26N-14	HEAD BASE SPRING
15	FU16B-11	REC/PB HEAD
16	FU192-11	ERASE HEAD
17	WH50S-06	WIRE CONNECTOR
18	WH42S-00	WIRE CONNECTOR
19	F525-269	CAPSTAN MOTOR
20	F567-362	RELAY P.C. BOARD ASS'Y
21	F743-103	RELAY P.C. BOARD
22	AZ15S-00	LEAF SWITCH
23	UE16E-11	PUSH SWITCH

Ref. No.	Part No.	Description
24	FC39M-68	EJECT PREVENTION ARM
25	FC52H-12	SPRING, CASSETTE
26	FD45G-12	PLAY ARM ASS'Y
27	FD45B-14	CAM GEAR
28	FD44T-14	SWITCH ARM, REC
29	FD44Y-12	SWITCH ARM, PACK
30	FD44V-12	SWITCH ARM, METAL
31	FF17W-21	MAIN BELT
32	FJ111-30	NON-METAL WASHER (2.6 x 0.25 mm)
33	FJ111-14	NON-METAL WASHER (2.6 x 0.5 mm)
34	FK28L-16	EJECT PREVENTION SPRING
35	FK28R-11	SLIDE SPRING
36	FR22D-11	FLYWHEEL ASS'Y
37	FR20L-21A	PINCH ROLLER
38	FG114-14	SCREW (2.6 x 5 mm)
39	UG15S-11A	SCREW (7.7 mm)
40	UG13U-15	E-STOP, RING
41	UG12H-16	SCREW (3.0 x 8 mm)
42	FF17C-12	HOLDER CUSHION
43	F765-263	SOLENOID ASS'Y
44	FL39H-12A	SHAFT
45	FL39K-12	PLUNGER

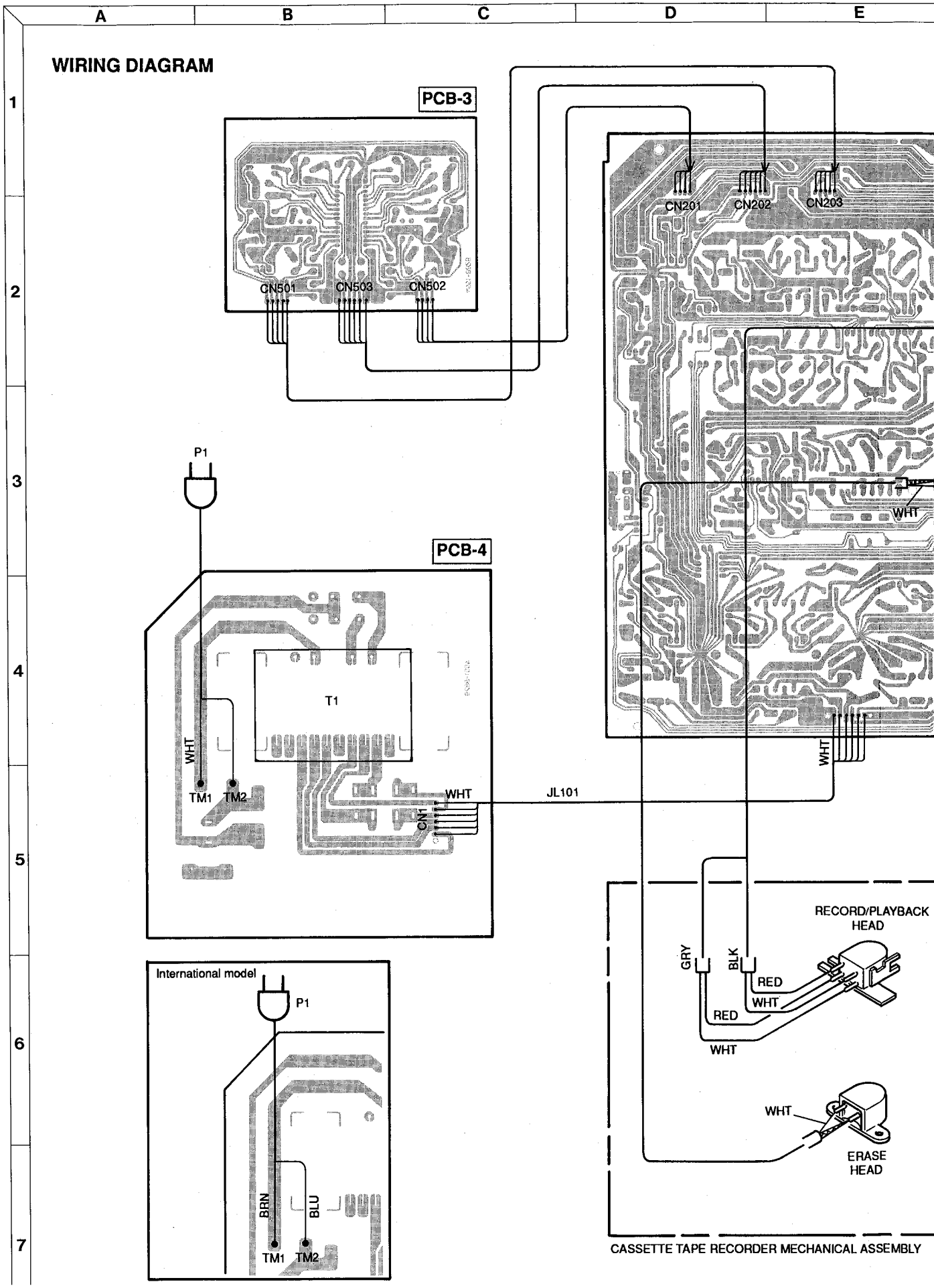
WIRING DIAGRAM



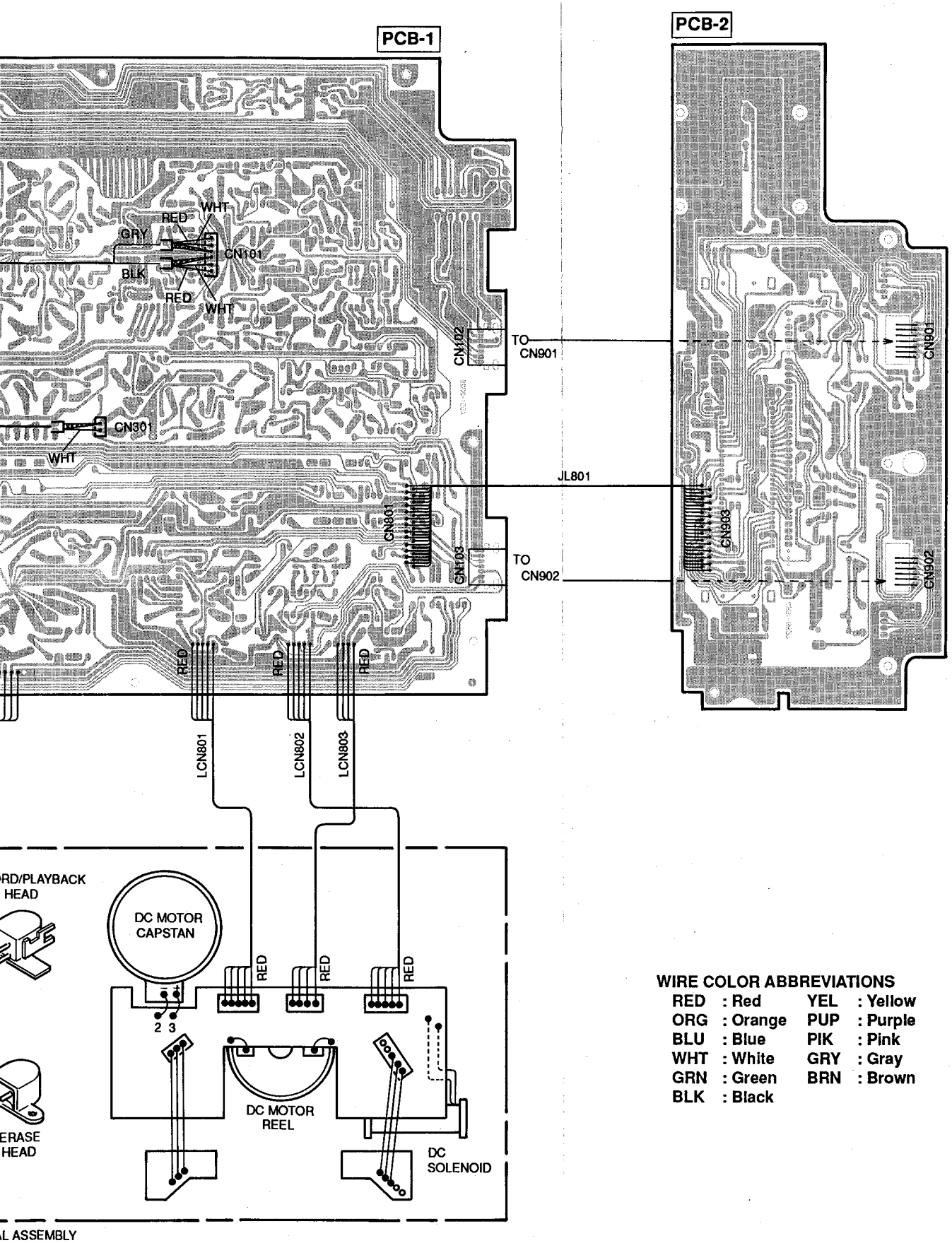
WIRE COLOR ABBREVIATIONS

RED	: Red	YEL	: Yellow
ORG	: Orange	PUP	: Purple
BLU	: Blue	PIK	: Pink
WHT	: White	GRY	: Gray
GRN	: Green	BRN	: Brown
BLK	: Black		

WIRING DIAGRAM



E	F	G	H	I	J

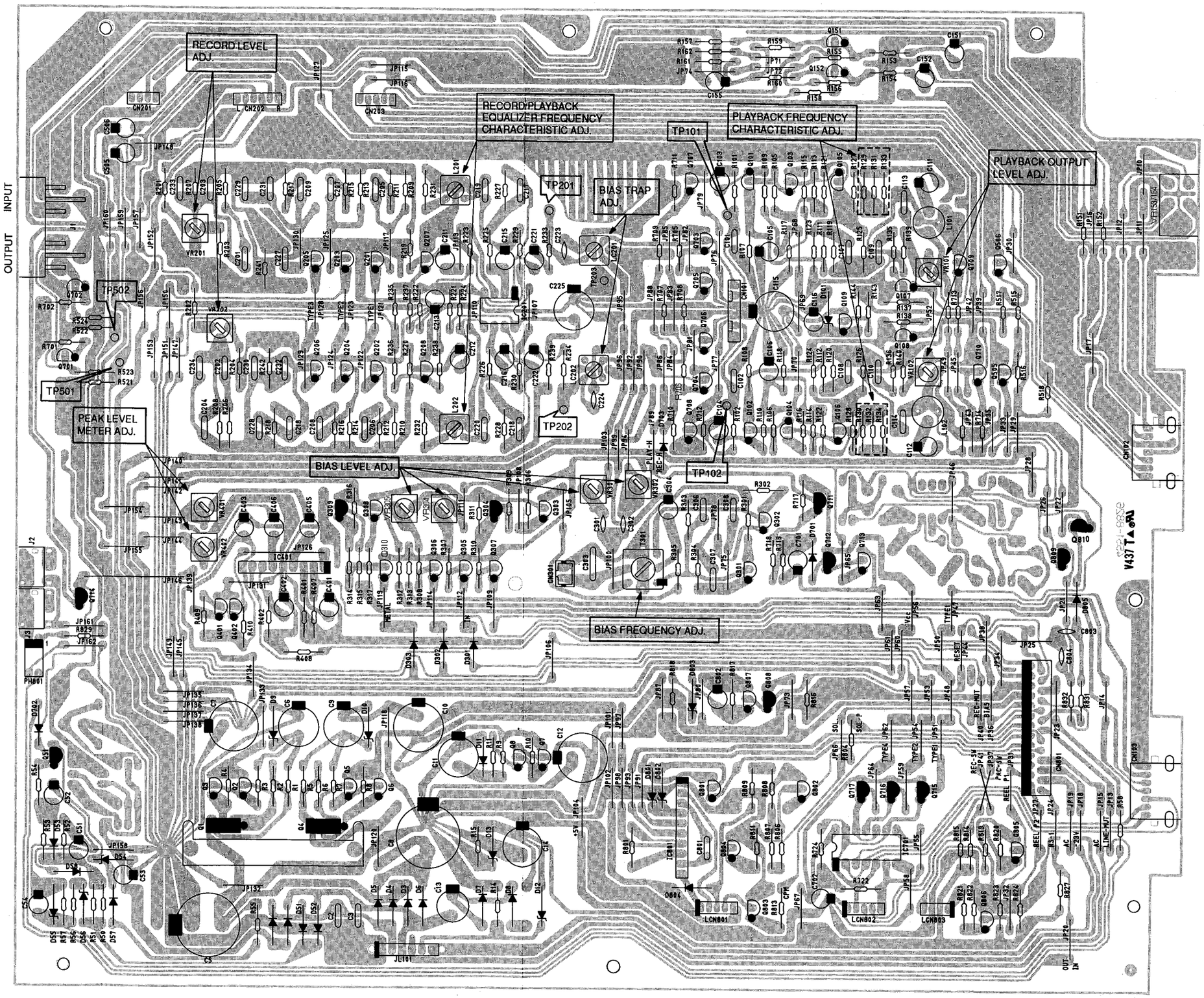


WIRE COLOR ABBREVIATIONS

RED	: Red	YEL	: Yellow
ORG	: Orange	PUP	: Purple
BLU	: Blue	PIK	: Pink
WHT	: White	GRY	: Gray
GRN	: Green	BRN	: Brown
BLK	: Black		

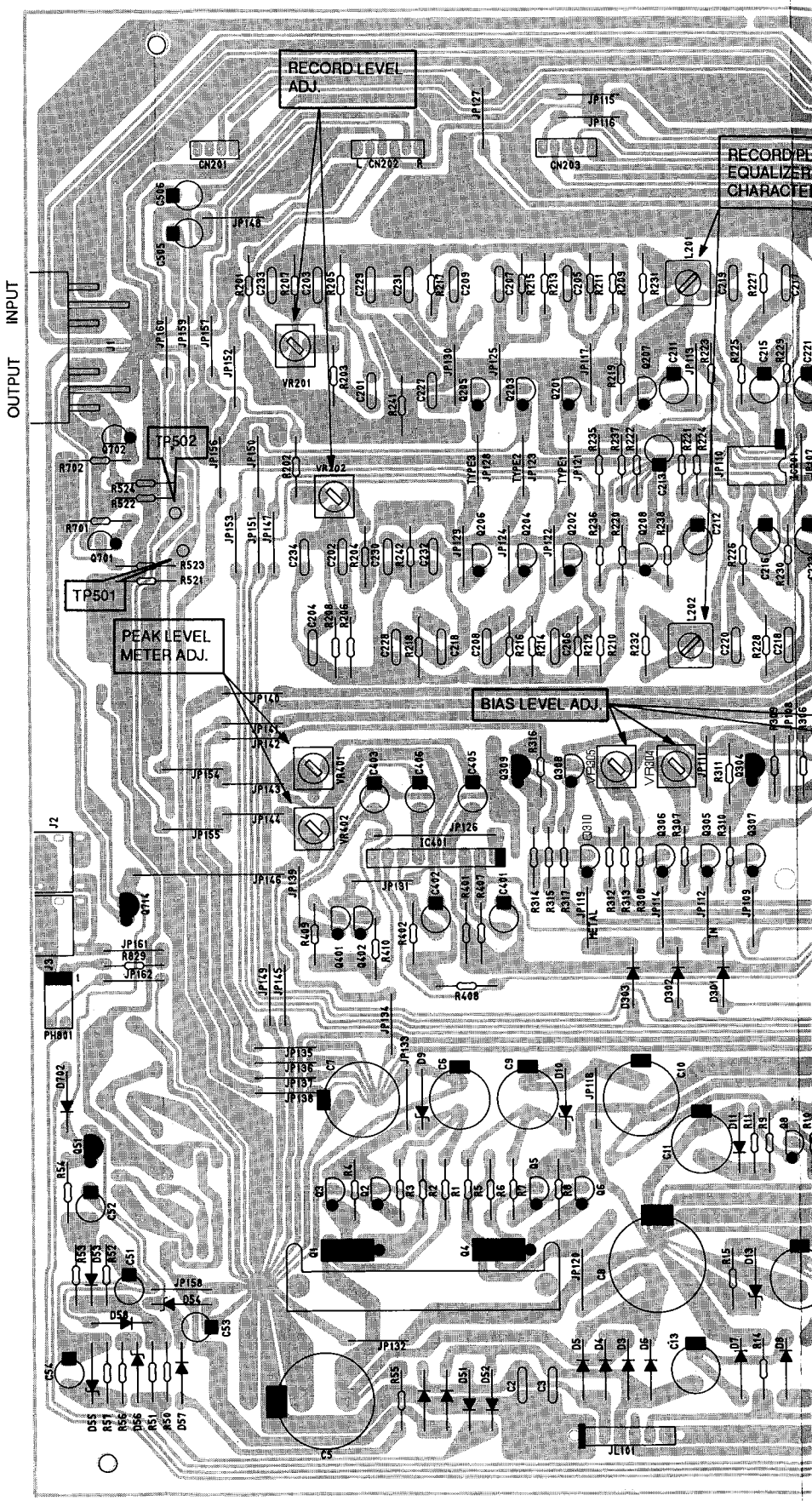
P. C. BOARDS (1)

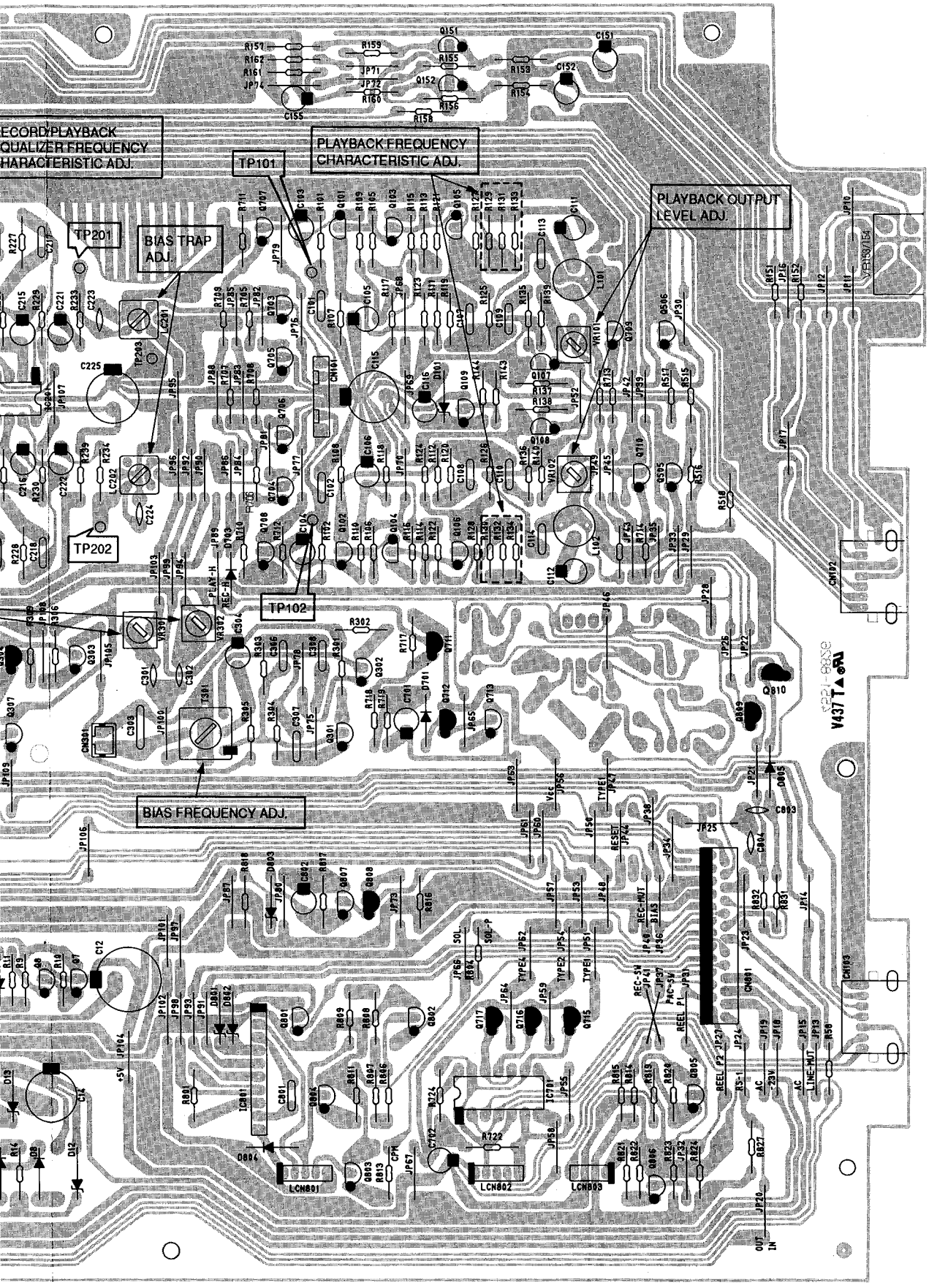
PCB-1 Main P. C. Board



P. C. BOARDS (1)

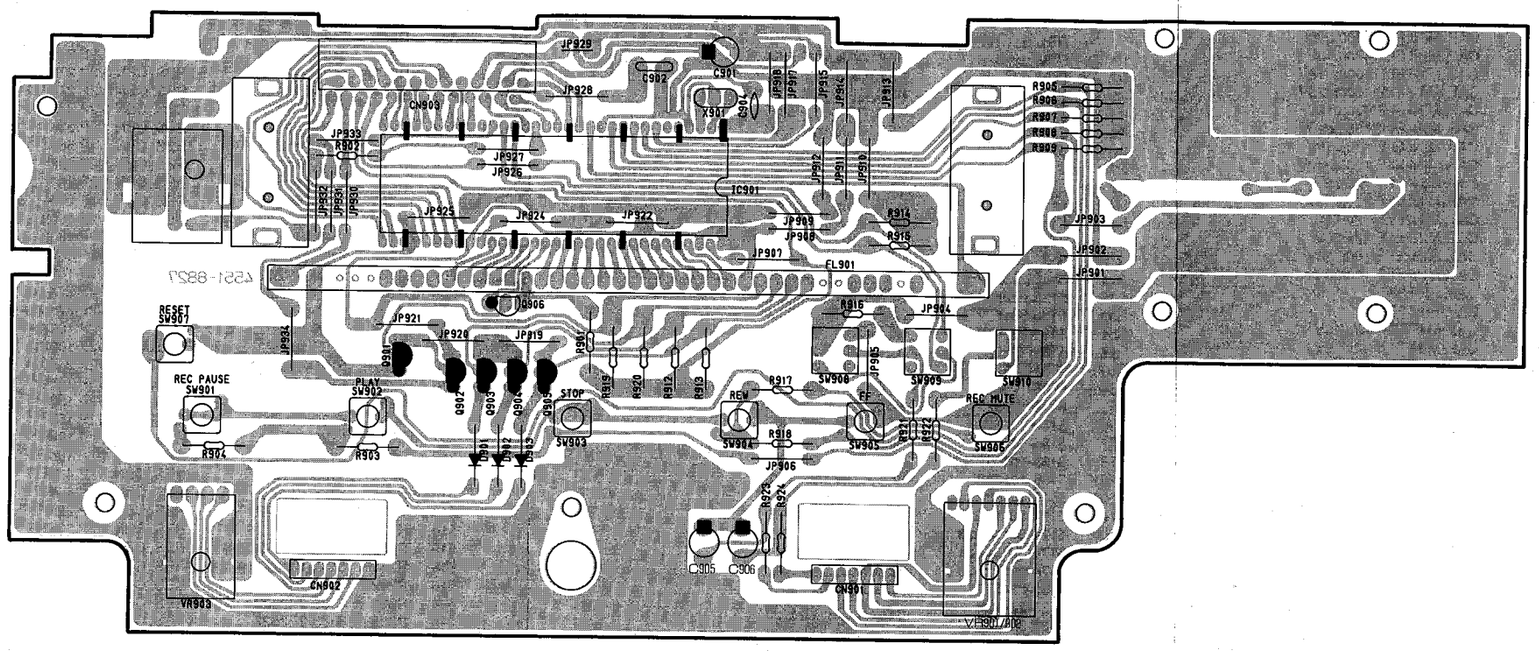
PCB-1 Main P. C. Board



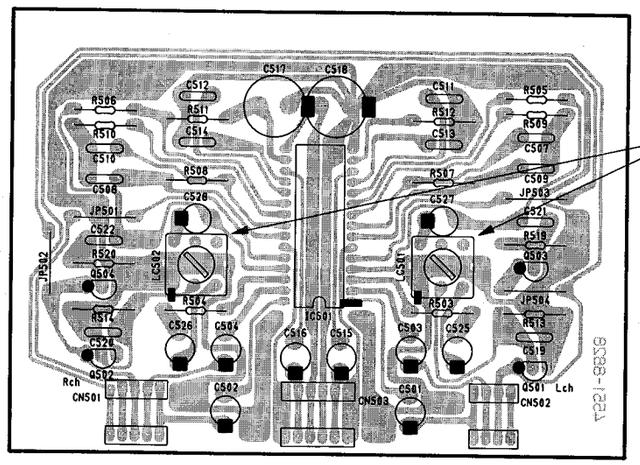

ECORD/PLAYBACK
QUALIZER FREQUENCY
HARACTERISTIC ADJ.
TP101
PLAYBACK FREQUENCY
CHARACTERISTIC ADJ.
PLAYBACK OUTPUT
LEVEL ADJ.
TP201
BIAS TRAP
ADJ.
TP202
TP102
BIAS FREQUENCY ADJ.
V437TA

P. C. BOARDS (2)

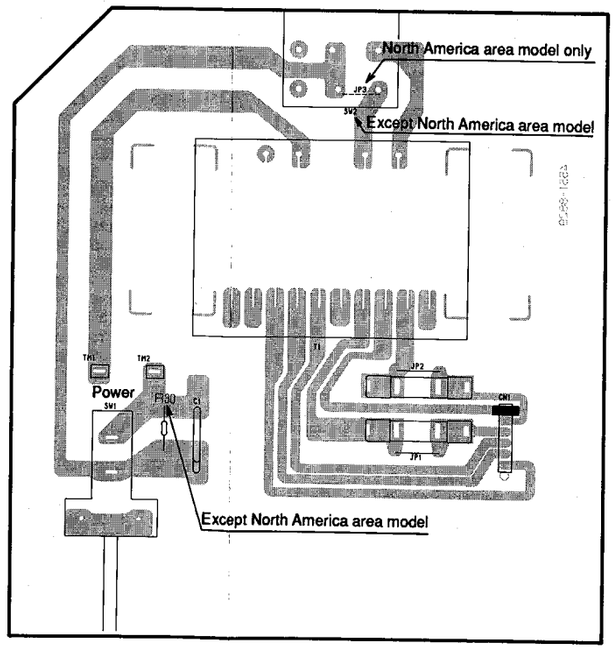
PCB-2 Front P. C. Board



PCB-3 Dolby NR P. C. Board

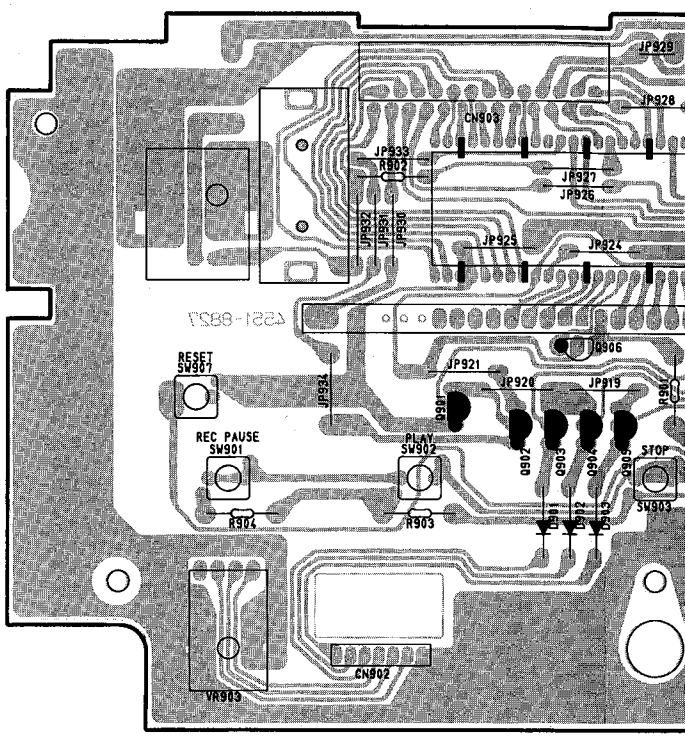


PCB-4 Power P. C. Board

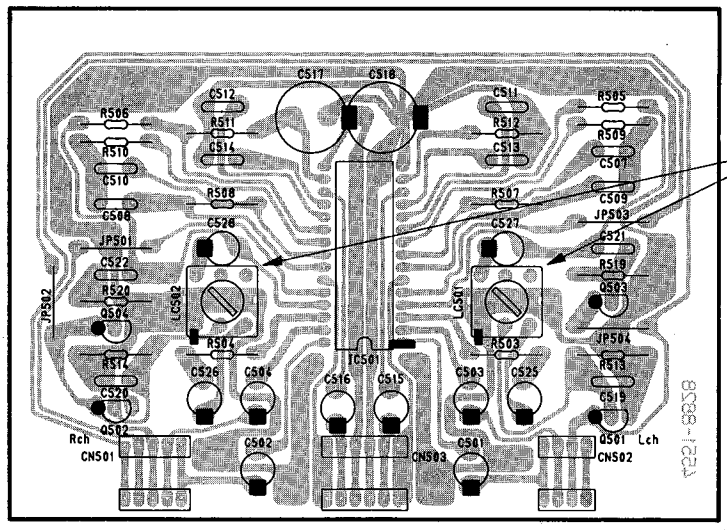


P. C. BOARDS (2)

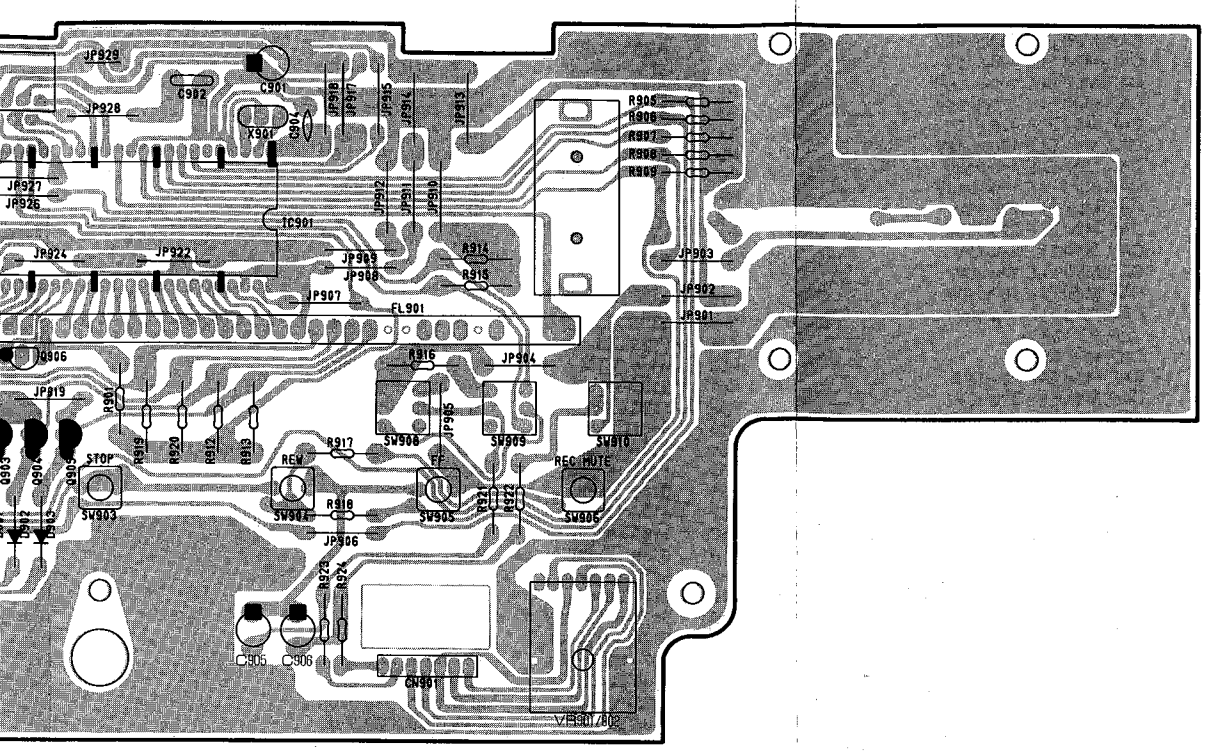
PCB-2 **Front P. C. Board**



PCB-3 **Dolby NR P. C. Board**

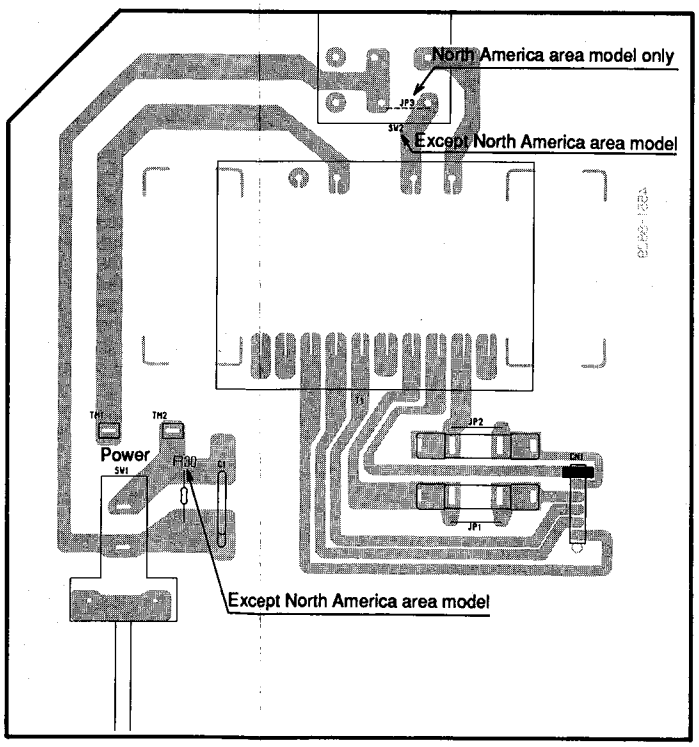


E | F | G | H | I | J



FILTER

PCB-4 Power P. C. Board



ELECTRICAL PARTS LIST

Ser. No.	Ref. No.	Part No.	Description
		PCB-1 MAIN P. C. BOARD	
		CAPACITORS	
616	C2	5352-S060K104	CAP, MTL .1µ
616	C3	5352-S060K104	CAP, MTL .1µ
603	C5	5345-228D041	CAP, MINI ELE 2200µ/25V
604	C6	5345-477C041	CAP, MINI ELE 470µ/16V
605	C7	5345-108C041	CAP, MINI ELE 1000µ/16V
607	C8	5345-478D0962	CAP, MINI ELE 4700µ/25V
604	C9	5345-477C041	CAP, MINI ELE 470µ/16V
605	C10	5345-108C041	CAP, MINI ELE 1000µ/16V
604	C11	5345-477C041	CAP, MINI ELE 470µ/16V
606	C12	5345-108B041	CAP, MINI ELE 1000µ/10V
610	C13	5345-226E041	CAP, MINI ELE 22µ/35V
609	C14	5345-227E041	CAP, MINI ELE 220µ/35V
684	C51	5345-226F041	CAP, MINI ELE 22µ/50V
684	C52	5345-226F041	CAP, MINI ELE 22µ/50V
685	C53	5345-107C041	CAP, MINI ELE 100µ/16V
686	C54	5345-106F041	CAP, MINI ELE 10µ/50V
427	C101	5359-S010K331	CAP, PPP 330p
427	C102	5359-S010K331	CAP, PPP 330p
416	C103	5345-226C0951	CAP, MINI ELE 22µ/16V
416	C104	5345-226C0951	CAP, MINI ELE 22µ/16V
419	C105	5345-107B041	CAP, MINI ELE 100µ/10V
419	C106	5345-107B041	CAP, MINI ELE 100µ/10V
424	C107	5359-S010J682	CAP, PPP 6800p
424	C108	5359-S010J682	CAP, PPP 6800p
424	C109	5359-S010J682	CAP, PPP 6800p
424	C110	5359-S010J682	CAP, PPP 6800p
415	C111	5345-106C0951	CAP, MINI ELE 10µ/16V
415	C112	5345-106C0951	CAP, MINI ELE 10µ/16V
423	C113	5359-S010J122	CAP, PPP 1200p
423	C114	5359-S010J122	CAP, PPP 1200p
420	C115	5345-477C041	CAP, MINI ELE 470µ/16V
417	C116	5345-336C041	CAP, MINI ELE 33µ/16V
754	C151	5345-106C0951	CAP, MINI ELE 10µ/16V
754	C152	5345-106C0951	CAP, MINI ELE 10µ/16V
755	C155	5345-107B041	CAP, MINI ELE 100µ/10V
485	C201	5359-S010J152	CAP, PPP 1500p
485	C202	5359-S010J152	CAP, PPP 1500p
484	C203	5359-S010J821	CAP, PPP 820p
484	C204	5359-S010J821	CAP, PPP 820p
486	C205	5359-S010J123	CAP, PPP .012µ
486	C206	5359-S010J123	CAP, PPP .012µ
487	C207	5359-S010J222	CAP, PPP 2200p
487	C208	5359-S010J222	CAP, PPP 2200p
488	C209	5359-S010J681	CAP, PPP 680p
488	C210	5359-S010J681	CAP, PPP 680p
478	C211	5345-105F0951	CAP, MINI ELE 1µ/50V
478	C212	5345-105F0951	CAP, MINI ELE 1µ/50V
480	C213	5345-226D041	CAP, MINI ELE 22µ/25V
480	C215	5345-226D041	CAP, MINI ELE 22µ/25V
480	C216	5345-226D041	CAP, MINI ELE 22µ/25V
492	C217	5354-124593	CAP, MYL .12µ
492	C218	5354-124593	CAP, MYL .12µ
489	C219	5359-S010J103	CAP, PPP .01µ
489	C220	5359-S010J103	CAP, PPP .01µ
479	C221	5345-225F0951	CAP, MINI ELE 2.2µ/50V
479	C222	5345-225F0951	CAP, MINI ELE 2.2µ/50V
481	C223	5361-221KB	CAP, CER 220p
481	C224	5361-221KB	CAP, CER 220p
482	C225	5345-227C041	CAP, MINI ELE 220µ/16V
493	C227	5359-S010J821	CAP, PPP 820p
493	C228	5359-S010J821	CAP, PPP 820p
494	C229	5359-S010J471	CAP, PPP 470p
494	C230	5359-S010J471	CAP, PPP 470p
495	C231	5359-S010J102	CAP, PPP 1000p
495	C232	5359-S010J102	CAP, PPP 1000p
490	C233	5359-S010K391	CAP, PPP 390p
490	C234	5359-S010K391	CAP, PPP 390p
535	C301	5361-1010423	CAP, CER 100p
535	C302	5361-1010423	CAP, CER 100p
534	C303	5354-S040K103	CAP, MYL .01µ
530	C304	5345-476D041	CAP, MINI ELE 47µ/25V
533	C306	5359-S010J562	CAP, PPP 5600p
533	C307	5359-S010J562	CAP, PPP 5600p
532	C308	5359-S010J103	CAP, PPP .01µ
712	C401	5345-475F041	CAP, MINI ELE 4.7µ/50V
712	C402	5345-475F041	CAP, MINI ELE 4.7µ/50V
713	C403	5345-476D041	CAP, MINI ELE 47µ/25V
712	C405	5345-475F041	CAP, MINI ELE 4.7µ/50V
712	C406	5345-475F041	CAP, MINI ELE 4.7µ/50V
650	C505	5345-106C0951	CAP, MINI ELE 10µ/16V
650	C506	5345-106C0951	CAP, MINI ELE 10µ/16V
683	C701	5345-106F041	CAP, MINI ELE 10µ/50V
683	C702	5345-106F041	CAP, MINI ELE 10µ/50V
866	C801	5359-S010J103	CAP, PPP .01µ
864	C802	5345-107B041	CAP, MINI ELE 100µ/10V
867	C803	5361-102KB	CAP, CER 1000p
867	C804	5361-102KB	CAP, CER 1000p
		RESISTORS	
619	R1	5135-152522	RES, CBN 1/2P 1.5K
620	R2	5135-471522	RES, CBN 1/2P 470
621	R3	5135-101522	RES, CBN 1/2P 100
622	R4	5135-3R9522	RES, CBN 1/2P 3.9
619	R5	5135-152522	RES, CBN 1/2P 1.5K
620	R6	5135-471522	RES, CBN 1/2P 470
621	R7	5135-101522	RES, CBN 1/2P 100
623	R8	5135-1R2522	RES, CBN 1/2P 1.2
619	R9	5135-152522	RES, CBN 1/2P 1.5K
620	R10	5135-471522	RES, CBN 1/2P 470
621	R11	5135-101522	RES, CBN 1/2P 100
636	R12	5135-221522	RES, CBN 1/2P 220
624	R14	5135-223522	RES, CBN 1/2P 22K
624	R15	5135-223522	RES, CBN 1/2P 22K
625	R50	5135-331522	RES, CBN 1/2P 330
625	R51	5135-331522	RES, CBN 1/2P 330
691	R52	5135-222522	RES, CBN 1/2P 2.2K
696	R53	5135-105522	RES, CBN 1/2P 1M
693	R54	5135-104522	RES, CBN 1/2P 100K
698	R55	5135-182522	RES, CBN 1/2P 1.8K
699	R56	5135-102522	RES, CBN 1/2P 1K
699	R57	5135-102522	RES, CBN 1/2P 1K
687	R58	5135-103522	RES, CBN 1/2P 10K
437	R101	5135-101522	RES, CBN 1/2P 100
437	R102	5135-101522	RES, CBN 1/2P 100
448	R105	5174-S010F223	RES, MTL 1/4 22K
448	R106	5174-S010F223	RES, MTL 1/4 22K
441	R107	5174-S010F331	RES, MTL 1/4 330
441	R108	5174-S010F331	RES, MTL 1/4 330
450	R109	5135-224522	RES, CBN 1/2P 220K
450	R110	5135-224522	RES, CBN 1/2P 220K
446	R111	5135-332522	RES, CBN 1/2P 3.3K
446	R112	5135-332522	RES, CBN 1/2P 3.3K
444	R113	5135-562522	RES, CBN 1/2P 5.6K
444	R114	5135-562522	RES, CBN 1/2P 5.6K
435	R115	5135-470522	RES, CBN 1/2P 47
435	R116	5135-470522	RES, CBN 1/2P 47
439	R117	5135-681522	RES, CBN 1/2P 680
439	R118	5135-681522	RES, CBN 1/2P 680
451	R119	5135-684522	RES, CBN 1/2P 680K
451	R120	5135-684522	RES, CBN 1/2P 680K
438	R121	5135-331522	RES, CBN 1/2P 330
438	R122	5135-331522	RES, CBN 1/2P 330
442	R123	5135-102522	RES, CBN 1/2P 1K
442	R124	5135-102522	RES, CBN 1/2P 1K
445	R125	5135-822522	RES, CBN 1/2P 8.2K
445	R126	5135-822522	RES, CBN 1/2P 8.2K
440	R127	5135-821522	RES, CBN 1/2P 820
440	R128	5135-821522	RES, CBN 1/2P 820
434	R129	5135-332522	RES, CBN 1/2P 3.3K
434	R130	5135-332522	RES, CBN 1/2P 3.3K
436	R131	5135-472522	RES, CBN 1/2P 4.7K
436	R132	5135-472522	RES, CBN 1/2P 4.7K
434	R133	5135-332522	RES, CBN 1/2P 3.3K
434	R134	5135-332522	RES, CBN 1/2P 3.3K
443	R135	5135-392522	RES, CBN 1/2P 3.9K
443	R136	5135-392522	RES, CBN 1/2P 3.9K
453	R137	5135-105522	RES, CBN 1/2P 1M
453	R138	5135-105522	RES, CBN 1/2P 1M
447	R139	5135-103522	RES, CBN 1/2P 10K
447	R140	5135-103522	RES, CBN 1/2P 10K
431	R143	5135-4R7522	RES, CBN 1/2P 4.7
442	R144	5135-102522	RES, CBN 1/2P 1K
750	R151	5135-102522	RES, CBN 1/2P 1K
750	R152	5135-102522	RES, CBN 1/2P 1K
750	R153	5135-102522	RES, CBN 1/2P 1K
750	R154	5135-102522	RES, CBN 1/2P 1K
751	R155	5135-104522	RES, CBN 1/2P 100K
751	R156	5135-104522	RES, CBN 1/2P 100K
750	R157	5135-102522	RES, CBN 1/2P 1K
750	R158	5135-102522	RES, CBN 1/2P 1K
750	R159	5135-102522	RES, CBN 1/2P 1K
750	R160	5135-102522	RES, CBN 1/2P 1K
752	R161	5135-472522	RES, CBN 1/2P 4.7K
753	R162	5135-562522	RES, CBN 1/2P 5.6K
496	R201	5135-152522	RES, CBN 1/2P 1.5K
496	R202	5135-152522	RES, CBN 1/2P 1.5K
497	R203	5135-222522	RES, CBN 1/2P 2.2K
497	R204	5135-222522	RES, CBN 1/2P 2.2K
498	R205	5135-104522	RES, CBN 1/2P 100K
498	R206	5135-104522	RES, CBN 1/2P 100K
499	R207	5135-223522	RES, CBN 1/2P 22K
499	R208	5135-223522	RES, CBN 1/2P 22K
500	R209	5135-822522	RES, CBN 1/2P 8.2K
500	R210	5135-822522	RES, CBN 1/2P 8.2K
501	R211	5135-682522	RES, CBN 1/2P 6.8K
501	R212	5135-682522	RES, CBN 1/2P 6.8K
508	R213	5135-273522	RES, CBN 1/2P 27K
508	R214	5135-273522	RES, CBN 1/2P 27K
502	R215	5135-333522	RES, CBN 1/2P 33K
502	R216	5135-333522	RES, CBN 1/2P 33K
504	R217	5135-563522	RES, CBN 1/2P 56K
504	R218	5135-563522	RES, CBN 1/2P 56K
505	R219	5135-222522	RES, CBN 1/2P 2.2K
505	R220	5135-222522	RES, CBN 1/2P 2.2K
506	R221	5135-184522	RES, CBN 1/2P 180K
506	R222	5135-184522	RES, CBN 1/2P 180K
507	R223	5135-104522	RES, CBN 1/2P 100K
507	R224	5135-104522	RES, CBN 1/2P 100K
508	R225	5135-273522	RES, CBN 1/2P 27K
508	R226	5135-273522	RES, CBN 1/2P 27K
509	R227	5135-104522	RES, CBN 1/2P 100K
509	R228	5135-104522	RES, CBN 1/2P 100K
510	R229	5135-222522	RES, CBN 1/2P 2.2K
510	R230	5135-222522	RES, CBN 1/2P 2.2K
511	R231	5135-151522	RES, CBN 1/2P 150
511	R232	5135-151522	RES, CBN 1/2P 150
512	R233	5135-103522	RES, CBN 1/2P 10K
512	R234	5135-103522	RES, CBN 1/2P 10K
513	R235	5135-472522	RES, CBN 1/2P 4.7K
513	R236	5135-472522	RES, CBN 1/2P 4.7K
514	R237	5135-223522	RES, CBN 1/2P 22K
514	R238	5135-223522	RES, CBN 1/2P 22K
515	R239	5135-331522	RES, CBN 1/2P 330
516	R241	5135-103522	RES, CBN 1/2P 10K
516	R242	5135-103522	RES, CBN 1/2P 10K
544	R301	5135-2R2522	RES, CBN 1/2P 2.2
544	R302	5135-2R2522	RES, CBN 1/2P 2.2
548	R303	5135-153522	RES, CBN 1/2P 15K
548	R304	5135-153522	RES, CBN 1/2P 15K
531	⚠ R305	5135-4R7522	RES, CBN 1/2P 4.7
546	R306	5135-563522	RES, CBN 1/2P 56K
549	R307	5135-331522	RES, CBN 1/2P 330
547	R308	5135-102522	RES, CBN 1/2P 1K
542	R309	5135-272522	RES, CBN 1/2P 2.7K
548	R310	5135-153522	RES, CBN 1/2P 15K
548	R311	5135-153522	RES, CBN 1/2P 15K
550	R312	5135-221522	RES, CBN 1/2P 220
543	R313	5135-123522	RES, CBN 1/2P 12K
545	R314	5135-103522	RES, CBN 1/2P 10K
553	R315	5135-821522	RES, CBN 1/2P 820
551	R316	5135-103522	RES, CBN 1/2P 10K
552	R317	5135-101522	RES, CBN 1/2P 100
719	R401	5135-334522	RES, CBN 1/2P 330K
719	R402	5135-334522	RES, CBN 1/2P 330K
720	R407	5135-103522	RES, CBN 1/2P 10K
720	R408	5135-103522	RES, CBN 1/2P 10K
721	R409	5135-223522	RES, CBN 1/2P 22K
721	R410	5135-223522	RES, CBN 1/2P 22K
662	R515	5135-103522	RES, CBN 1/2P 10K
669	R516	5135-123522	RES, CBN 1/2P 12K
667	R517	5135-223522	RES, CBN 1/2P 22K
662	R518	5135-103522	RES, CBN 1/2P 10K
663	R521	5135-104522	RES, CBN 1/2P 100K
663	R522	5135-104522	RES, CBN 1/2P 100K
658	R523	5135-222522	RES, CBN 1/2P 2.2K
658	R524	5135-222522	RES, CBN 1/2P 2.2K
691	R701	5135-222522	RES, CBN 1/2P 2.2K
691	R702	5135-222522	RES, CBN 1/2P 2.2K
688	R705	5135-103522	RES, CBN 1/2P 10K
688	R706	5135-103522	RES, CBN 1/2P 10K
689	R707	5135-392522	RES, CBN 1/2P 3.9K
689	R708	5135-392522	RES, CBN 1/2P 3.9K
688	R709	5135-103522	RES, CBN 1/2P 10K
688	R710	5135-103522	RES, CBN 1/2P 10K
690	R711	5135-223522	RES, CBN 1/2P 22K
690	R712	5135-223522	RES, CBN 1/2P 22K
687	R713	5135-103522	RES, CBN 1/2P 10K
687	R714	5135-103522	RES, CBN 1/2P 10K
691	R717	5135-222522	RES, CBN 1/2P 2.2K
687	R718	5135-103522	RES, CBN 1/2P 10K
687	R719	5135-103522	RES, CBN 1/2P 10K
694	R722	5135-473522	RES, CBN 1/2P 47K
694	R724	5135-473522	RES, CBN 1/2P 47K
871	⚠ R801	5102-1004715	RES, FUSE 10
872	R804	5135-103522	RES, CBN 1/2P 10K
873	R806	5135-5R6522	RES, CBN 1/2P 5.6
873	R807	5135-5R6522	RES, CBN 1/2P 5.6
873	R808	5135-5R6522	RES, CBN 1/2P 5.6
873	R809	5135-5R6522	RES, CBN 1/2P 5.6
872	R811	5135-103522	RES, CBN 1/2P 10K
872	R813	5135-103522	RES, CBN 1/2P 10K
877	R814	5135-473522	RES, CBN 1/2P 47K
877	R815	5135-473522	RES, CBN 1/2P 47K
872	R816	5135-103522	RES, CBN 1/2P 10K
874	R817	5135-471522	RES, CBN 1/2P 470
875	R818	5135-102522	RES, CBN 1/2P 1K
878	R819	5135-222522	RES, CBN 1/2P 2.2K
876	R820	5135-223522	RES, CBN 1/2P 22K
878	R821	5135-222522	RES, CBN 1/2P 2.2K
876	R822	5135-223522	RES, CBN 1/2P 22K
877	R823	5135-473522	RES, CBN 1/2P 47K
877	R824	5135-473522	RES, CBN 1/2P 47K
880	R827	5135-472522	RES, CBN 1/2P 4.7K
879	R829	5135-561522	RES, CBN 1/2P 560
875	R831	5135-102522	RES, CBN 1/2P 1K
875	R832	5135-102522	RES, CBN 1/2P 1K
		INTEGRATED CIRCUITS	
461	IC201	5653-UPC4570C	IC, LINEAR
702	IC401	5653-BA6138	IC, LINEAR
671	IC701	5654-TC4011BP	IC, DIGITAL
851	IC801	5653-BA6229	IC, LINEAR
		TRANSISTORS	
581	⚠ Q1	5612-1375	XISTOR, PNP A
586	Q2	5613-2320(F)	XISTOR, NPN R
586	Q3	5613-2320(F)	XISTOR, NPN R
581	Q4	5612-1375	XISTOR, PNP A
586	Q5	5613-2320(F)	XISTOR, NPN R
586	Q6	5613-2320(F)	XISTOR, NPN R
584	Q7	5611-966(Y)	XISTOR, PNP R
586	Q8	5613-2320(F)	XISTOR, NPN R
678	Q51	5611-999(F)	XISTOR, PNP R
401	Q101	5613-1775(F)	XISTOR, NPN R
401	Q102	5613-1775(F)	XISTOR, NPN R
401	Q103	5613-1775(F)	XISTOR, NPN R
401	Q104	5613-1775(F)	XISTOR, NPN R
402	Q105	5613-2320L(F)	XISTOR, NPN R
402	Q106	5613-2320L(F)	XISTOR, NPN R
404	Q107	5613-UN4214	XISTOR, NPN R
404	Q108	5613-UN4214	XISTOR, NPN R
403	Q109	5613-2320(F)	XISTOR, NPN R
756	Q151	5613-2320L(F)	XISTOR, NPN R
756	Q152	5613-2320L(F)	XISTOR, NPN R
463	Q201	5613-UN4214	XISTOR, NPN R
463	Q202	5613-UN4214	XISTOR, NPN R
463	Q203	5613-UN4214	XISTOR, NPN R
463	Q204	5613-UN4214	XISTOR, NPN R
463	Q205	5613-UN4214	XISTOR, NPN R
463	Q206	5613-UN4214	XISTOR, NPN R
464	Q207	5614-1450(T)	XISTOR, NPN A
464	Q208	5614-1450(T)	XISTOR, NPN A
521	Q301	5613-2120(Y)	XISTOR, NPN R
521	Q302	5613-2120(Y)	XISTOR, NPN R
521	Q303	5613-2120(Y)	XISTOR, NPN R
523	Q304	5611-1309A(R)	XISTOR, PNP R
524	Q305	5613-UN4214	XISTOR, NPN R
524	Q306	5613-UN4214	XISTOR, NPN R
524	Q307	5613-UN4214	XISTOR, NPN R
521	Q308	5613-2120(Y)	XISTOR, NPN R
523	Q309	5611-1309A(R)	XISTOR, PNP R
524	Q310	5613-UN4214	XISTOR, NPN R
715	Q401	5613-UN4214	XISTOR, NPN R
716	Q402	5613-3311A(R)	XISTOR, NPN R
642	Q505	5613-UN4214	XISTOR, NPN R
644	Q506	5613-3311A(R)	XISTOR, NPN R
673	Q701	5613-2878(B)	XISTOR, NPN R
673	Q702	5613-2878(B)	XISTOR, NPN R
672	Q703	5613-2240(BL)	XISTOR, NPN R
672	Q704	5613-2240(BL)	XISTOR, NPN R
672	Q705	5613-2240(BL)	XISTOR, NPN R
672	Q706	5613-2240(BL)	XISTOR, NPN R
677	Q707	5614-1450(T)	XISTOR, NPN A
677	Q708	5614-1450(T)	XISTOR, NPN A
677	Q709	5614-1450(T)	XISTOR, NPN A
677	Q710	5614-1450(T)	XISTOR, NPN A
675	Q711	5611-970(BL)	XISTOR, PNP R
676	Q712	5611-UN4114	XISTOR, PNP R
674	Q713	5613-UN4214	XISTOR, NPN R
676	Q714	5611-UN4114	XISTOR, PNP R

ELECTRICAL PARTS LIST

Ser. No.	Ref. No.	Part No.	Description
		PCB-1 MAIN P. C. BOARD	
		CAPACITORS	
616	C2	5352-S060K104	CAP, MTL .1µ
616	C3	5352-S060K104	CAP, MTL .1µ
603	C5	5345-228D041	CAP, MINI ELE 2200µ/25V
604	C6	5345-477C041	CAP, MINI ELE 470µ/16V
605	C7	5345-108C041	CAP, MINI ELE 1000µ/16V
607	C8	5345-478D0962	CAP, MINI ELE 4700µ/25V
604	C9	5345-477C041	CAP, MINI ELE 470µ/16V
605	C10	5345-108C041	CAP, MINI ELE 1000µ/16V
604	C11	5345-477C041	CAP, MINI ELE 470µ/16V
606	C12	5345-108B041	CAP, MINI ELE 1000µ/10V
610	C13	5345-226E041	CAP, MINI ELE 22µ/35V
609	C14	5345-227E041	CAP, MINI ELE 220µ/35V
684	C51	5345-226F041	CAP, MINI ELE 22µ/50V
684	C52	5345-226F041	CAP, MINI ELE 22µ/50V
685	C53	5345-107C041	CAP, MINI ELE 100µ/16V
686	C54	5345-106F041	CAP, MINI ELE 10µ/50V
427	C101	5359-S010K331	CAP, PPP 330p
427	C102	5359-S010K331	CAP, PPP 330p
416	C103	5345-226C0951	CAP, MINI ELE 22µ/16V
416	C104	5345-226C0951	CAP, MINI ELE 22µ/16V
419	C105	5345-107B041	CAP, MINI ELE 100µ/10V
419	C106	5345-107B041	CAP, MINI ELE 100µ/10V
424	C107	5359-S010J682	CAP, PPP 6800p
424	C108	5359-S010J682	CAP, PPP 6800p
424	C109	5359-S010J682	CAP, PPP 6800p
424	C110	5359-S010J682	CAP, PPP 6800p
415	C111	5345-106C0951	CAP, MINI ELE 10µ/16V
415	C112	5345-106C0951	CAP, MINI ELE 10µ/16V
423	C113	5359-S010J122	CAP, PPP 1200p
423	C114	5359-S010J122	CAP, PPP 1200p
420	C115	5345-477C041	CAP, MINI ELE 470µ/16V
417	C116	5345-336C041	CAP, MINI ELE 33µ/16V
754	C151	5345-106C0951	CAP, MINI ELE 10µ/16V
754	C152	5345-106C0951	CAP, MINI ELE 10µ/16V
755	C155	5345-107B041	CAP, MINI ELE 100µ/10V
485	C201	5359-S010J152	CAP, PPP 1500p
485	C202	5359-S010J152	CAP, PPP 1500p
484	C203	5359-S010J821	CAP, PPP 820p
484	C204	5359-S010J821	CAP, PPP 820p
486	C205	5359-S010J123	CAP, PPP .012µ
486	C206	5359-S010J123	CAP, PPP .012µ
487	C207	5359-S010J222	CAP, PPP 2200p
487	C208	5359-S010J222	CAP, PPP 2200p
488	C209	5359-S010J681	CAP, PPP 680p
488	C210	5359-S010J681	CAP, PPP 680p
478	C211	5345-105F0951	CAP, MINI ELE 1µ/50V
478	C212	5345-105F0951	CAP, MINI ELE 1µ/50V
480	C213	5345-226D041	CAP, MINI ELE 22µ/25V
480	C215	5345-226D041	CAP, MINI ELE 22µ/25V
480	C216	5345-226D041	CAP, MINI ELE 22µ/25V
492	C217	5354-124593	CAP, MYL .12µ
492	C218	5354-124593	CAP, MYL .12µ
489	C219	5359-S010J103	CAP, PPP .01µ
489	C220	5359-S010J103	CAP, PPP .01µ
479	C221	5345-225F0951	CAP, MINI ELE 2.2µ/50V
479	C222	5345-225F0951	CAP, MINI ELE 2.2µ/50V
481	C223	5361-221KB	CAP, CER 220p
481	C224	5361-221KB	CAP, CER 220p
482	C225	5345-227C041	CAP, MINI ELE 220µ/16V
493	C227	5359-S010J821	CAP, PPP 820p
493	C228	5359-S010J821	CAP, PPP 820p
494	C229	5359-S010J471	CAP, PPP 470p
494	C230	5359-S010J471	CAP, PPP 470p
495	C231	5359-S010J102	CAP, PPP 1000p
495	C232	5359-S010J102	CAP, PPP 1000p
490	C233	5359-S010K391	CAP, PPP 390p
490	C234	5359-S010K391	CAP, PPP 390p
535	C301	5361-1010423	CAP, CER 100p
535	C302	5361-1010423	CAP, CER 100p
534	C303	5354-S040K103	CAP, MYL .01µ
530	C304	5345-476D041	CAP, MINI ELE 47µ/25V
533	C306	5359-S010J562	CAP, PPP 5600p
533	C307	5359-S010J562	CAP, PPP 5600p
532	C308	5359-S010J103	CAP, PPP .01µ
712	C401	5345-475F041	CAP, MINI ELE 4.7µ/50V
712	C402	5345-475F041	CAP, MINI ELE 4.7µ/50V
713	C403	5345-476D041	CAP, MINI ELE 47µ/25V
712	C405	5345-475F041	CAP, MINI ELE 4.7µ/50V
712	C406	5345-475F041	CAP, MINI ELE 4.7µ/50V
650	C505	5345-106C0951	CAP, MINI ELE 10µ/16V
650	C506	5345-106C0951	CAP, MINI ELE 10µ/16V
683	C701	5345-106F041	CAP, MINI ELE 10µ/50V
683	C702	5345-106F041	CAP, MINI ELE 10µ/50V
866	C801	5359-S010J103	CAP, PPP .01µ
864	C802	5345-107B041	CAP, MINI ELE 100µ/10V
867	C803	5361-102KB	CAP, CER 1000p
867	C804	5361-102KB	CAP, CER 1000p
		RESISTORS	
619	R1	5135-152522	RES, CBN 1/2P 1.5K
620	R2	5135-471522	RES, CBN 1/2P 470
621	R3	5135-101522	RES, CBN 1/2P 100
622	R4	5135-3R9522	RES, CBN 1/2P 3.9
619	R5	5135-152522	RES, CBN 1/2P 1.5K
620	R6	5135-471522	RES, CBN 1/2P 470
621	R7	5135-101522	RES, CBN 1/2P 100
623	R8	5135-1R2522	RES, CBN 1/2P 1.2
619	R9	5135-152522	RES, CBN 1/2P 1.5K
620	R10	5135-471522	RES, CBN 1/2P 470
621	R11	5135-101522	RES, CBN 1/2P 100
636	R12	5135-221522	RES, CBN 1/2P 220
624	R14	5135-223522	RES, CBN 1/2P 22K
624	R15	5135-223522	RES, CBN 1/2P 22K
625	R50	5135-331522	RES, CBN 1/2P 330
625	R51	5135-331522	RES, CBN 1/2P 330
691	R52	5135-222522	RES, CBN 1/2P 2.2K
696	R53	5135-105522	RES, CBN 1/2P 1M
693	R54	5135-104522	RES, CBN 1/2P 100K
698	R55	5135-182522	RES, CBN 1/2P 1.8K
699	R56	5135-102522	RES, CBN 1/2P 1K
699	R57	5135-102522	RES, CBN 1/2P 1K
687	R58	5135-103522	RES, CBN 1/2P 10K
437	R101	5135-101522	RES, CBN 1/2P 100
437	R102	5135-101522	RES, CBN 1/2P 100
448	R105	5174-S010F223	RES, MTL 1/4 22K
448	R106	5174-S010F223	RES, MTL 1/4 22K
441	R107	5174-S010F331	RES, MTL 1/4 330
441	R108	5174-S010F331	RES, MTL 1/4 330
450	R109	5135-224522	RES, CBN 1/2P 220K
450	R110	5135-224522	RES, CBN 1/2P 220K
446	R111	5135-332522	RES, CBN 1/2P 3.3K
446	R112	5135-332522	RES, CBN 1/2P 3.3K
444	R113	5135-562522	RES, CBN 1/2P 5.6K
444	R114	5135-562522	RES, CBN 1/2P 5.6K
435	R115	5135-470522	RES, CBN 1/2P 47
435	R116	5135-470522	RES, CBN 1/2P 47
439	R117	5135-681522	RES, CBN 1/2P 680
439	R118	5135-681522	RES, CBN 1/2P 680
451	R119	5135-684522	RES, CBN 1/2P 680K
451	R120	5135-684522	RES, CBN 1/2P 680K
438	R121	5135-331522	RES, CBN 1/2P 330
438	R122	5135-331522	RES, CBN 1/2P 330
442	R123	5135-102522	RES, CBN 1/2P 1K
442	R124	5135-102522	RES, CBN 1/2P 1K
445	R125	5135-822522	RES, CBN 1/2P 8.2K
445	R126	5135-822522	RES, CBN 1/2P 8.2K
440	R127	5135-821522	RES, CBN 1/2P 820
440	R128	5135-821522	RES, CBN 1/2P 820
434	R129	5135-332522	RES, CBN 1/2P 3.3K
434	R130	5135-332522	RES, CBN 1/2P 3.3K
436	R131	5135-472522	RES, CBN 1/2P 4.7K
436	R132	5135-472522	RES, CBN 1/2P 4.7K
434	R133	5135-332522	RES, CBN 1/2P 3.3K
434	R134	5135-332522	RES, CBN 1/2P 3.3K
443	R135	5135-392522	RES, CBN 1/2P 3.9K
443	R136	5135-392522	RES, CBN 1/2P 3.9K
453	R137	5135-105522	RES, CBN 1/2P 1M
453	R138	5135-105522	RES, CBN 1/2P 1M
447	R139	5135-103522	RES, CBN 1/2P 10K
447	R140	5135-103522	RES, CBN 1/2P 10K
431	R143	5135-4R7522	RES, CBN 1/2P 4.7
442	R144	5135-102522	RES, CBN 1/2P 1K
750	R151	5135-102522	RES, CBN 1/2P 1K
750	R152	5135-102522	RES, CBN 1/2P 1K
750	R153	5135-102522	RES, CBN 1/2P 1K
750	R154	5135-102522	RES, CBN 1/2P 1K
751	R155	5135-104522	RES, CBN 1/2P 100K
751	R156	5135-104522	RES, CBN 1/2P 100K
750	R157	5135-102522	RES, CBN 1/2P 1K
750	R158	5135-102522	RES, CBN 1/2P 1K
750	R159	5135-102522	RES, CBN 1/2P 1K
750	R160	5135-102522	RES, CBN 1/2P 1K
752	R161	5135-472522	RES, CBN 1/2P 4.7K
753	R162	5135-562522	RES, CBN 1/2P 5.6K
496	R201	5135-152522	RES, CBN 1/2P 1.5K
496	R202	5135-152522	RES, CBN 1/2P 1.5K
497	R203	5135-222522	RES, CBN 1/2P 2.2K
497	R204	5135-222522	RES, CBN 1/2P 2.2K

Ser. No.	Ref. No.	Part No.	Description
498	R205	5135-104522	RES, CBN 1/2P 100K
498	R206	5135-104522	RES, CBN 1/2P 100K
499	R207	5135-223522	RES, CBN 1/2P 22K
499	R208	5135-223522	RES, CBN 1/2P 22K
500	R209	5135-822522	RES, CBN 1/2P 8.2K
500	R210	5135-822522	RES, CBN 1/2P 8.2K
501	R211	5135-682522	RES, CBN 1/2P 6.8K
501	R212	5135-682522	RES, CBN 1/2P 6.8K
508	R213	5135-273522	RES, CBN 1/2P 27K
508	R214	5135-273522	RES, CBN 1/2P 27K
502	R215	5135-333522	RES, CBN 1/2P 33K
502	R216	5135-333522	RES, CBN 1/2P 33K
504	R217	5135-563522	RES, CBN 1/2P 56K
504	R218	5135-563522	RES, CBN 1/2P 56K
505	R219	5135-222522	RES, CBN 1/2P 2.2K
505	R220	5135-222522	RES, CBN 1/2P 2.2K
506	R221	5135-184522	RES, CBN 1/2P 180K
506	R222	5135-184522	RES, CBN 1/2P 180K
507	R223	5135-104522	RES, CBN 1/2P 100K
507	R224	5135-104522	RES, CBN 1/2P 100K
508	R225	5135-273522	RES, CBN 1/2P 27K
508	R226	5135-273522	RES, CBN 1/2P 27K
509	R227	5135-104522	RES, CBN 1/2P 100K
509	R228	5135-104522	RES, CBN 1/2P 100K
510	R229	5135-222522	RES, CBN 1/2P 2.2K
510	R230	5135-222522	RES, CBN 1/2P 2.2K
511	R231	5135-151522	RES, CBN 1/2P 150
511	R232	5135-151522	RES, CBN 1/2P 150
512	R233	5135-103522	RES, CBN 1/2P 10K
512	R234	5135-103522	RES, CBN 1/2P 10K
513	R235	5135-472522	RES, CBN 1/2P 4.7K
513	R236	5135-472522	RES, CBN 1/2P 4.7K
514	R237	5135-223522	RES, CBN 1/2P 22K
514	R238	5135-223522	RES, CBN 1/2P 22K
515	R239	5135-331522	RES, CBN 1/2P 330
516	R241	5135-103522	RES, CBN 1/2P 10K
516	R242	5135-103522	RES, CBN 1/2P 10K
544	R301	5135-2R2522	RES, CBN 1/2P 2.2
544	R302	5135-2R2522	RES, CBN 1/2P 2.2
548	R303	5135-153522	RES, CBN 1/2P 15K
548	R304	5135-153522	RES, CBN 1/2P 15K
531 ⚠	R305	5135-4R7522	RES, CBN 1/2P 4.7
546	R306	5135-563522	RES, CBN 1/2P 56K
549	R307	5135-331522	RES, CBN 1/2P 330
547	R308	5135-102522	RES, CBN 1/2P 1K
542	R309	5135-272522	RES, CBN 1/2P 2.7K
548	R310	5135-153522	RES, CBN 1/2P 15K
548	R311	5135-153522	RES, CBN 1/2P 15K
550	R312	5135-221522	RES, CBN 1/2P 220
543	R313	5135-123522	RES, CBN 1/2P 12K
545	R314	5135-103522	RES, CBN 1/2P 10K
553	R315	5135-821522	RES, CBN 1/2P 820
551	R316	5135-103522	RES, CBN 1/2P 10K
552	R317	5135-101522	RES, CBN 1/2P 100
719	R401	5135-334522	RES, CBN 1/2P 330K
719	R402	5135-334522	RES, CBN 1/2P 330K
720	R407	5135-103522	RES, CBN 1/2P 10K
720	R408	5135-103522	RES, CBN 1/2P 10K
721	R409	5135-223522	RES, CBN 1/2P 22K
721	R410	5135-223522	RES, CBN 1/2P 22K
662	R515	5135-103522	RES, CBN 1/2P 10K
669	R516	5135-123522	RES, CBN 1/2P 12K
667	R517	5135-223522	RES, CBN 1/2P 22K
662	R518	5135-103522	RES, CBN 1/2P 10K
663	R521	5135-104522	RES, CBN 1/2P 100K
663	R522	5135-104522	RES, CBN 1/2P 100K
658	R523	5135-222522	RES, CBN 1/2P 2.2K
658	R524	5135-222522	RES, CBN 1/2P 2.2K
691	R701	5135-222522	RES, CBN 1/2P 2.2K
691	R702	5135-222522	RES, CBN 1/2P 2.2K
688	R705	5135-103522	RES, CBN 1/2P 10K
688	R706	5135-103522	RES, CBN 1/2P 10K
689	R707	5135-392522	RES, CBN 1/2P 3.9K
689	R708	5135-392522	RES, CBN 1/2P 3.9K
688	R709	5135-103522	RES, CBN 1/2P 10K
688	R710	5135-103522	RES, CBN 1/2P 10K
690	R711	5135-223522	RES, CBN 1/2P 22K
690	R712	5135-223522	RES, CBN 1/2P 22K
687	R713	5135-103522	RES, CBN 1/2P 10K
687	R714	5135-103522	RES, CBN 1/2P 10K
691	R717	5135-222522	RES, CBN 1/2P 2.2K
687	R718	5135-103522	RES, CBN 1/2P 10K
687	R719	5135-103522	RES, CBN 1/2P 10K
694	R722	5135-473522	RES, CBN 1/2P 47K
694	R724	5135-473522	RES, CBN 1/2P 47K
871 ⚠	R801	5102-1004715	RES, FUSE 10
872	R804	5135-103522	RES, CBN 1/2P 10K
873	R806	5135-5R6522	RES, CBN 1/2P 5.6
873	R807	5135-5R6522	RES, CBN 1/2P 5.6
873	R808	5135-5R6522	RES, CBN 1/2P 5.6
873	R809	5135-5R6522	RES, CBN 1/2P 5.6
872	R811	5135-103522	RES, CBN 1/2P 10K
872	R813	5135-103522	RES, CBN 1/2P 10K
877	R814	5135-473522	RES, CBN 1/2P 47K
877	R815	5135-473522	RES, CBN 1/2P 47K
872	R816	5135-103522	RES, CBN 1/2P 10K
874	R817	5135-471522	RES, CBN 1/2P 470
875	R818	5135-102522	RES, CBN 1/2P 1K
878	R819	5135-222522	RES, CBN 1/2P 2.2K
876	R820	5135-223522	RES, CBN 1/2P 22K
878	R821	5135-222522	RES, CBN 1/2P 2.2K
876	R822	5135-223522	RES, CBN 1/2P 22K
877	R823	5135-473522	RES, CBN 1/2P 47K
877	R824	5135-473522	RES, CBN 1/2P 47K
880	R827	5135-472522	RES, CBN 1/2P 4.7K
879	R829	5135-561522	RES, CBN 1/2P 560
875	R831	5135-102522	RES, CBN 1/2P 1K
875	R832	5135-102522	RES, CBN 1/2P 1K
		INTEGRATED CIRCUITS	
461	IC201	5653-UPC4570C	IC, LINEAR
702	IC401	5653-BA6138	IC, LINEAR
671	IC701	5654-TC4011BP	IC, DIGITAL
851	IC801	5653-BA6229	IC, LINEAR
		TRANSISTORS	
581 ⚠	Q1	5612-1375	XISTOR, PNP A
586	Q2	5613-2320(F)	XISTOR, NPN R
586	Q3	5613-2320(F)	XISTOR, NPN R
581	Q4	5612-1375	XISTOR, PNP A
586	Q5	5613-2320(F)	XISTOR, NPN R
586	Q6	5613-2320(F)	XISTOR, NPN R
584	Q7	5611-966(Y)	XISTOR, PNP R
586	Q8	5613-2320(F)	XISTOR, NPN R
678	Q51	5611-999(F)	XISTOR, PNP R
401	Q101	5613-1775(F)	XISTOR, NPN R
401	Q102	5613-1775(F)	XISTOR, NPN R
401	Q103	5613-1775(F)	XISTOR, NPN R
401	Q104	5613-1775(F)	XISTOR, NPN R
402	Q105	5613-2320L(F)	XISTOR, NPN R
402	Q106	5613-2320L(F)	XISTOR, NPN R
404	Q107	5613-UN4214	XISTOR, NPN R
404	Q108	5613-UN4214	XISTOR, NPN R
403	Q109	5613-2320(F)	XISTOR, NPN R
756	Q151	5613-2320L(F)	XISTOR, NPN R
756	Q152	5613-2320L(F)	XISTOR, NPN R
463	Q201	5613-UN4214	XISTOR, NPN R
463	Q202	5613-UN4214	XISTOR, NPN R
463	Q203	5613-UN4214	XISTOR, NPN R
463	Q204	5613-UN4214	XISTOR, NPN R
463	Q205	5613-UN4214	XISTOR, NPN R
463	Q206	5613-UN4214	XISTOR, NPN R
464	Q207	5614-1450(T)	XISTOR, NPN A
464	Q208	5614-1450(T)	XISTOR, NPN A
521	Q301	5613-2120(Y)	XISTOR, NPN R
521	Q302	5613-2120(Y)	XISTOR, NPN R
521	Q303	5613-2120(Y)	XISTOR, NPN R
523	Q304	5611-1309A(R)	XISTOR, PNP R
524	Q305	5613-UN4214	XISTOR, NPN R
524	Q306	5613-UN4214	XISTOR, NPN R
524	Q307	5613-UN4214	XISTOR, NPN R
521	Q308	5613-2120(Y)	XISTOR, NPN R
523	Q309	5611-1309A(R)	XISTOR, PNP R
524	Q310	5613-UN4214	XISTOR, NPN R
715	Q401	5613-UN4214	XISTOR, NPN R
716	Q402	5613-3311A(R)	XISTOR, NPN R
642	Q505	5613-UN4214	XISTOR, NPN R
644	Q506	5613-3311A(R)	XISTOR, NPN R
673	Q701	5613-2878(B)	XISTOR, NPN R
673	Q702	5613-2878(B)	XISTOR, NPN R
672	Q703	5613-2240(BL)	XISTOR, NPN R
672	Q704	5613-2240(BL)	XISTOR, NPN R
672	Q705	5613-2240(BL)	XISTOR, NPN R
672	Q706	5613-2240(BL)	XISTOR, NPN R
677	Q707	5614-1450(T)	XISTOR, NPN A
677	Q708	5614-1450(T)	XISTOR, NPN A
677	Q709	5614-1450(T)	XISTOR, NPN A
677	Q710	5614-1450(T)	XISTOR, NPN A
675	Q711	5611-970(BL)	XISTOR, PNP R
676	Q712	5611-UN4114	XISTOR, PNP R
674	Q713	5613-UN4214	XISTOR, NPN R
676	Q714	5611-UN4114	XISTOR, PNP R

Ser. No.	Ref. No.	Part No.	Description
676	Q715	5611-UN4114	XISTOR, PNP R
676	Q716	5611-UN4114	XISTOR, PNP R
676	Q717	5611-UN4114	XISTOR, PNP R
856	Q801	5613-UN4214	XISTOR, NPN R
855	Q802	5613-2925(T)	XISTOR, NPN R
855	Q803	5613-2925(T)	XISTOR, NPN R
855	Q804	5613-2925(T)	XISTOR, NPN R
854	Q805	5613-3311A(R)	XISTOR, NPN R
854	Q806	5613-3311A(R)	XISTOR, NPN R
854	Q807	5613-3311A(R)	XISTOR, NPN R
853	Q808	5611-UN4114	XISTOR, PNP R
853	Q809	5611-UN4114	XISTOR, PNP R
853	Q810	5611-UN4114	XISTOR, PNP R
		DIODES	
589	⚠D3	5632-S5566B	DIODE, RECT
589	⚠D4	5632-S5566B	DIODE, RECT
589	⚠D5	5632-S5566B	DIODE, RECT
589	⚠D6	5632-S5566B	DIODE, RECT
589	D7	5632-S5566B	DIODE, RECT
589	D8	5632-S5566B	DIODE, RECT
591	D9	5635-HZ12B2L	DIODE, ZENER
591	D10	5635-HZ12B2L	DIODE, ZENER
593	D11	5635-HZ6B2L	DIODE, ZENER
592	D12	5635-HZ6A1L	DIODE, ZENER
594	D13	5635-HZ18-2L	DIODE, ZENER
680	⚠D51	5631-1S2473	DIODE, DET
680	⚠D52	5631-1S2473	DIODE, DET
680	D53	5631-1S2473	DIODE, DET
681	D54	5635-HZ11C1L	DIODE, ZENER
682	D55	5635-RD5R1EB2	DIODE, ZENER
680	D56	5631-1S2473	DIODE, DET
680	D57	5631-1S2473	DIODE, DET
595	D58	5635-HZ16-2L	DIODE, ZENER
406	D101	5635-HZ11B2L	DIODE, ZENER
526	D301	5631-1S2473	DIODE, DET
526	D302	5631-1S2473	DIODE, DET
526	D303	5631-1S2473	DIODE, DET
679	D701	5631-1S2473	DIODE, DET
679	D702	5631-1S2473	DIODE, DET
679	D703	5631-1S2473	DIODE, DET
859	D801	5635-HZ7C3	DIODE, ZENER
858	D802	5635-HZ5C2	DIODE, ZENER
860	D803	5635-HZ3B2	DIODE, ZENER
861	D804	5632-S5566B	DIODE, RECT
862	D805	5631-1S2473	DIODE, DET
		COILS	
409	L101	5995-S200J273	COIL W/CORE
409	L102	5995-S200J273	COIL W/CORE
467	L201	5932-11501	COIL CASE, 7
467	L202	5932-11501	COIL CASE, 7
		CONTROLS	
411	VR101	5101-20301934	RES, SEMI FIX 20K
411	VR102	5101-20301934	RES, SEMI FIX 20K
738	VR153/154	5113-S0604503	RES, V CBN 16 50K
470	VR201	5101-20201934	RES, SEMI FIX 2K
470	VR202	5101-20201934	RES, SEMI FIX 2K
539	VR301	5101-10401934	RES, SEMI FIX 100K
539	VR302	5101-10401934	RES, SEMI FIX 100K
540	VR304	5101-50201934	RES, SEMI FIX 5K
541	VR305	5101-20301934	RES, SEMI FIX 20K
709	VR401	5101-20201934	RES, SEMI FIX 2K
709	VR402	5101-20201934	RES, SEMI FIX 2K
		MISCELLANEOUS	
782	J1	4484-46	PIN JACK, 4P
781	J2	4451-00184	JACK, 1P
781	J3	4451-00184	JACK, 1P
792	JL101	4242-R0506121	JUMPER LEAD
468	LC201	5214-13801	LC COMPOSITE
468	LC202	5214-13801	LC COMPOSITE
798	LCN801	4163-S0205161	CONNECTOR W/W
799	LCN802	4163-S0205121	CONNECTOR W/W
800	LCN803	4163-S0204141	CONNECTOR W/W
528	T301	5923-10301	OSC COIL, 10
857	PH801	5624-ON3161	PHOTO COUPLR
776	TP101	4214-132	TERMINAL
776	TP102	4214-132	TERMINAL
776	TP201	4214-132	TERMINAL
776	TP202	4214-132	TERMINAL
776	TP203	4214-132	TERMINAL
776	TP501	4214-132	TERMINAL
776	TP502	4214-132	TERMINAL

Ser. No.	Ref. No.	Part No.	Description
807	CN101	4443-0601102	CONNECTOR
814	CN102	4443-00501007	CONNECTOR
814	CN103	4443-00501007	CONNECTOR
786	CN201	4443-04501004	CONNECTOR
787	CN202	4443-04501006	CONNECTOR
788	CN203	4443-04501005	CONNECTOR
808	CN301	4443-0201102	CONNECTOR
810	CN801	4443-05501026	CONNECTOR

PCB-2 FRONT P. C. BOARD

		CAPACITORS	
833	C901	5345-106D041	CAP, MINI ELE 10μ/25V
834	C902	5359-S010J103	CAP, PPP .01μ
835	C904	5631-223ZF	CAP, CER .022μ
832	C905	5345-106D041	CAP, MINI ELE 10μ/25V
832	C906	5345-106D041	CAP, MINI ELE 10μ/25V
		RESISTORS	
841	R901	5135-104522	RES, CBN 1/2P 100K
837	R902	5135-102522	RES, CBN 1/2P 1K
838	R903	5135-183522	RES, CBN 1/2P 18K
839	R904	5135-273522	RES, CBN 1/2P 27K
839	R905	5135-273522	RES, CBN 1/2P 27K
839	R906	5135-273522	RES, CBN 1/2P 27K
839	R907	5135-273522	RES, CBN 1/2P 27K
839	R908	5135-273522	RES, CBN 1/2P 27K
839	R909	5135-273522	RES, CBN 1/2P 27K
841	R912	5135-104522	RES, CBN 1/2P 100K
841	R913	5135-104522	RES, CBN 1/2P 100K
836	R914	5135-473522	RES, CBN 1/2P 47K
836	R915	5135-473522	RES, CBN 1/2P 47K
840	R916	5135-182522	RES, CBN 1/2P 1.8K
839	R917	5135-273522	RES, CBN 1/2P 27K
838	R918	5135-183522	RES, CBN 1/2P 18K
841	R919	5135-104522	RES, CBN 1/2P 100K
841	R920	5135-104522	RES, CBN 1/2P 100K
837	R921	5135-102522	RES, CBN 1/2P 1K
837	R922	5135-102522	RES, CBN 1/2P 1K
837	R923	5135-102522	RES, CBN 1/2P 1K
837	R924	5135-102522	RES, CBN 1/2P 1K
		INTEGRATED CIRCUIT	
821	IC901	5654-MN18767J	IC, DIGITAL
		TRANSISTORS	
823	Q901	5611-UN4114	XISTOR, PNP R
823	Q902	5611-UN4114	XISTOR, PNP R
823	Q903	5611-UN4114	XISTOR, PNP R
823	Q904	5611-UN4114	XISTOR, PNP R
823	Q905	5611-UN4114	XISTOR, PNP R
824	Q906	5613-3311A(R)	XISTOR, NPN R
		DIODES	
828	D901	5631-1S2473	DIODE, DET
828	D902	5631-1S2473	DIODE, DET
828	D903	5631-1S2473	DIODE, DET
		CONTROLS	
742	VR901/902	5109-S0304104	RES, V CBN 12 100K
746	VR903	5109-S0402502	RES, V CBN 12 5K
		MISCELLANEOUS	
814	CN102	4443-00501007	CONNECTOR
814	CN103	4443-00501007	CONNECTOR
812	CN901	4443-00401007	CONNECTOR
812	CN902	4443-00401007	CONNECTOR
809	CN903	4443-05401026	CONNECTOR
758	FL901	5722-050	TUBE DISPLAY
827	X901	5693-FC4004A4	OSC, CER
735	SW901	4437-00604	PUSH SWITCH
735	SW902	4437-00604	PUSH SWITCH
735	SW903	4437-00604	PUSH SWITCH
735	SW904	4437-00604	PUSH SWITCH
735	SW905	4437-00604	PUSH SWITCH
735	SW906	4437-00604	PUSH SWITCH
736	SW907	4437-00603	PUSH SWITCH
733	SW908	4431-S0112306	PUSH SWITCH
733	SW909	4431-S0112306	PUSH SWITCH
733	SW910	4431-S0112306	PUSH SWITCH

Ser. No.	Ref. No.	Part No.	Description
		PCB-3 DOLBY NR P. C. BOARD	
		CAPACITORS	
647	C501	5345-105F0951	CAP, MINI ELE 1μ/50V
647	C502	5345-105F0951	CAP, MINI ELE 1μ/50V
647	C503	5345-105F0951	CAP, MINI ELE 1μ/50V
647	C504	5345-105F0951	CAP, MINI ELE 1μ/50V
654	C507	5359-S010J222	CAP, PPP 2200p
654	C508	5359-S010J222	CAP, PPP 2200p
654	C509	5359-S010J222	CAP, PPP 2200p
654	C510	5359-S010J222	CAP, PPP 2200p
651	C511	5354-564593	CAP, MYL .56μ
651	C512	5354-564593	CAP, MYL .56μ
652	C513	5354-334593	CAP, MYL .33μ
652	C514	5354-334593	CAP, MYL .33μ
648	C515	5345-106C0951	CAP, MINI ELE 10μ/16V
648	C516	5345-106C0951	CAP, MINI ELE 10μ/16V
649	C517	5345-227C041	CAP, MINI ELE 220μ/16V
649	C518	5345-227C041	CAP, MINI ELE 220μ/16V
656	C519	5359-S010J182	CAP, PPP 1800p
656	C520	5359-S010J182	CAP, PPP 1800p
655	C521	5359-S010J222	CAP, PPP 2200p
655	C522	5359-S010J222	CAP, PPP 2200p
648	C525	5345-106C0951	CAP, MINI ELE 10μ/16V
648	C526	5345-106C0951	CAP, MINI ELE 10μ/16V
648	C527	5345-106C0951	CAP, MINI ELE 10μ/16V
648	C528	5345-106C0951	CAP, MINI ELE 10μ/16V
		RESISTORS	
664	R503	5135-332522	RES, CBN 1/2P 3.3K
664	R504	5135-332522	RES, CBN 1/2P 3.3K
665	R505	5135-682522	RES, CBN 1/2P 6.8K
665	R506	5135-682522	RES, CBN 1/2P 6.8K
659	R507	5174-S010F243	RES, MTL 1/4 24K
659	R508	5174-S010F243	RES, MTL 1/4 24K
660	R509	5174-S010F561	RES, MTL 1/4 560
660	R510	5174-S010F561	RES, MTL 1/4 560
666	R511	5135-102522	RES, CBN 1/2P 1K
661	R512	5174-S010F273	RES, MTL 1/4 27K
668	R513	5135-105522	RES, CBN 1/2P 1M
668	R514	5135-105522	RES, CBN 1/2P 1M
668	R519	5135-105522	RES, CBN 1/2P 1M
668	R520	5135-105522	RES, CBN 1/2P 1M
		INTEGRATED CIRCUIT	
641	IC501	5653-CXA1330S	IC, LINEAR
		TRANSISTORS	
643	Q501	5613-UN4214	XISTOR, NPN R
643	Q502	5613-UN4214	XISTOR, NPN R
643	Q503	5613-UN4214	XISTOR, NPN R
643	Q504	5613-UN4214	XISTOR, NPN R
		MISCELLANEOUS	
816	CN501	4443-04401005	CONNECTOR
817	CN502	4443-04401004	CONNECTOR
818	CN503	4443-04401006	CONNECTOR
645	LC501	5214-13701	LC COMPOSITE
645	LC502	5214-13701	LC COMPOSITE
		PCB-4 POWER P. C. BOARD	
		CAPACITORS	
615	⚠C1	5352-S010M103	CAP, MTL .01μ (BK)
615B	⚠C1	5352-1030961	CAP, MTL .01μ (I) (IB) (G) (GB) (BB)
		RESISTORS	
042B	⚠R30	5135-335522	RES, CBN 1/2P 3.3M (I) (IB) (G) (GB) (BB)
		TRANSFORMERS	
601	⚠T1	5584-S8201	XFORMER, POWER (BK)
601B	⚠T1	5584-S8202	XFORMER, POWER (I) (IB) (G) (GB) (BB)
		MISCELLANEOUS	
731	⚠SW1	4433-00202	PUSH SWITCH, POWER
041B	⚠SW2	4411-1047111	ROTRY SWITCH, VOLT SELECT (I) (IB) (G) (GB) (BB)
806	CN1	4443-060185	CONNECTOR
777	TM1	4214-122	TERMINAL
777	TM2	4214-122	TERMINAL

Ser. No.	Ref. No.	Part No.	Description

ABBREVIATIONS IN PARTS LIST

CAPACITORS

CAP, MINI ELE	:Electrolytic
CAP, CER	:Ceramic
CAP, PPP	:Polypropylene
CAP, MYL	:Mylar
CAP, MTL	:Metal
CAP, MCA	:Mica
CAP, MINI BP	:Bipolar
CAP, ELE BP	:Electrolytic Bipolar
CAP, STY	:Polystyrene Film
CAP, SPE	:Special
CAP, TAN	:Tantalum
470μ	:470μF
6800p	:6800pF
.047μ	:0.047μF

RESISTORS

RES, CBN 1/6P	:Carbon 1/6W
RES, FUSE	:Fuse
RES, CEM 5P	:Cement 5W
RES, MTL 1P	:Metal 1W
2.2K	:2.2kΩ
220	:220Ω

TRANSISTORS

XISTOR	:Transistor
FET	:Field Effect Transistor

CONTROLS

RES, V CBN	:Variable Carbon Resistor
RES, SEMI FIX	:Semi-fixed Resistor

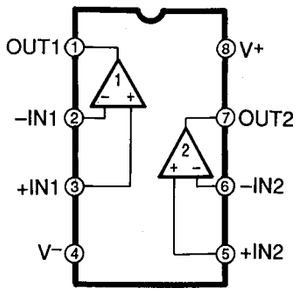
		CHASSIS MISCELLANEOUS	
761	⚠P1	4161-71151	CORD W/PLUG (BK)
761B	⚠P1	4161-7256	CORD W/PLUG (I) (IB) (G) (GB)
761F	⚠P1	4161-04100	CORD W/PLUG (BB)
762		4161-71184	CORD W/PLUG
791		4242-S0326131	JUMPER LEAD
		PACKAGE PARTS LIST	
021B		1756-06303	LABEL (I) (IB) (G) (GB) (BB)
022B		1756-03124	LABEL (G) (GB)
022C		1756-03108	LABEL (I) (IB)
022F		1756-03111	LABEL (BB)
024F		1111-J30319	OWNER GUIDE (BB)
106		1111-J30323	OWNER GUIDE (BK) (BB)
106B		1111-J30327	OWNER GUIDE (G) (GB)
106C		1111-J30324	OWNER GUIDE (I) (IB)
107		1113-717004	OWNER CARD (BK)
111		1119-047	ATTACH SHEET, WARRANTY (BK)
112		1119-0137	ATTACH SHEET, SERVICE AGENCIES (BK)
113		1119-01201	ATTACH SHEET, SAFETY (BK)
115		1221-28006	CARTON BOX (I) (G)
115A		1221-28001	CARTON BOX (BK) (IB) (GB) (BB)
116		1222-7362	CUSHION
117		1222-7365	CUSHION
119		1223-R0220055	SOFT SHEET, SET FRONT
123		1241-R0160600	POLYETHY BAG, SET
124		1241-R0123350	POLYETHY BAG, OWNER GUIDE

NOTE

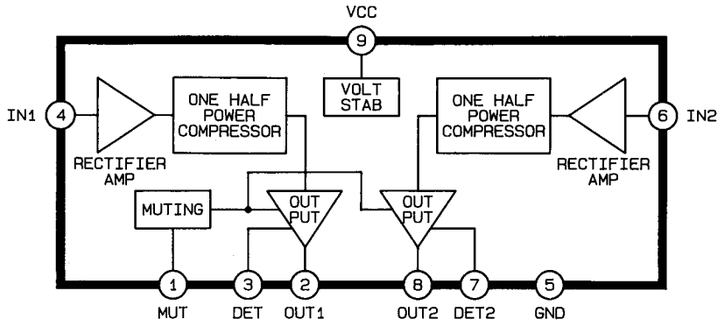
⚠ SAFETY RELATED COMPONENT. USE ONLY EXACT REPLACEMENT PART AS SPECIFIED.

IC BLOCK DIAGRAM

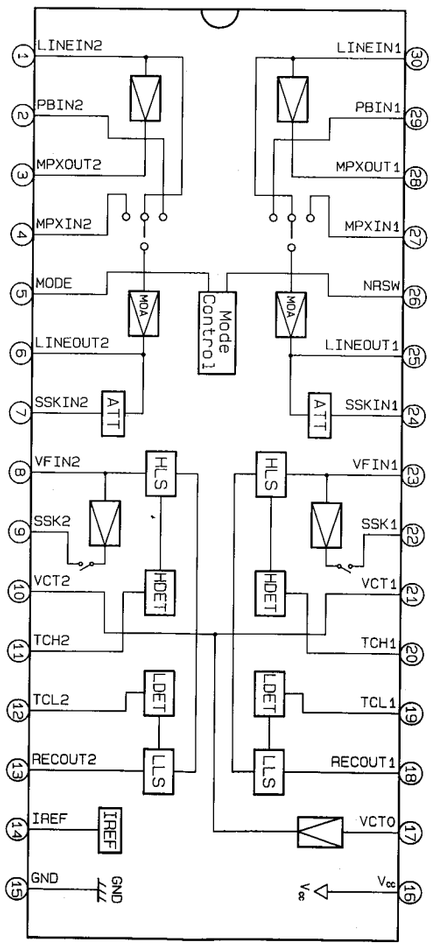
IC201 : μPC45710C
Dual OP-Amp.



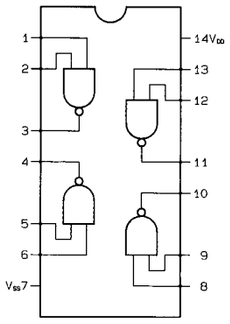
IC401 : BA6138
Signal Level Meter



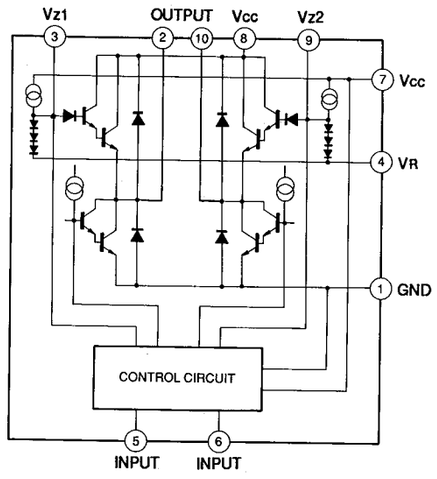
IC501 : CXA1330S
Dolby B/C NR



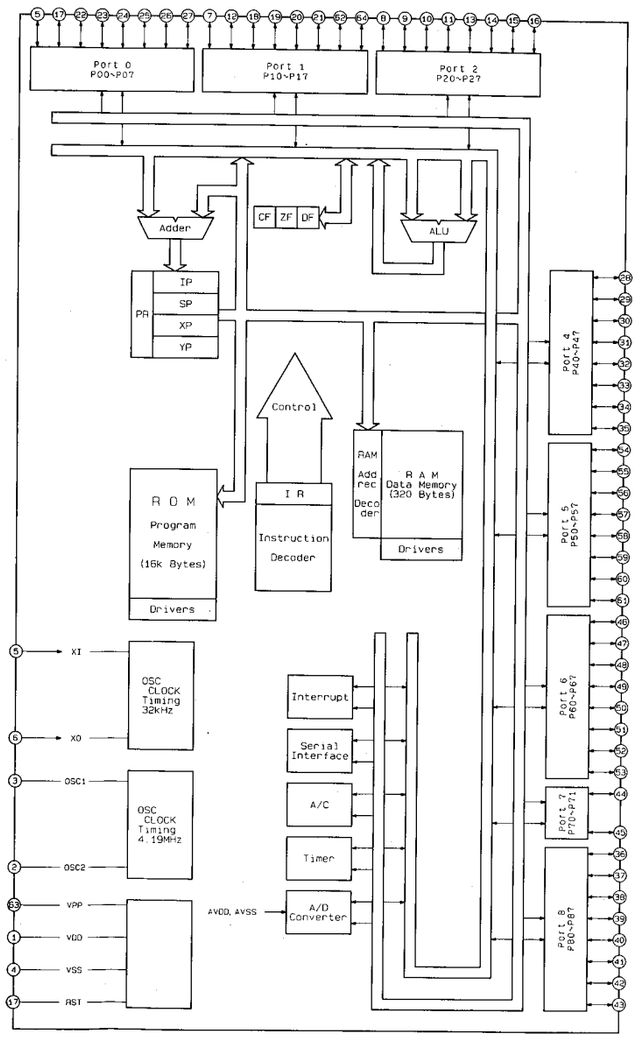
IC701 : TC4011BP
2-Input NAND Gate



IC801 : BA6229
Motor Driver



IC901 : MN187167J
Logic Controller



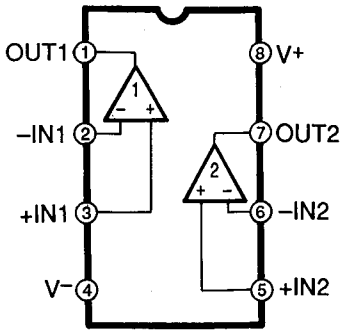
TERMINAL FUNCTIONS

Pin No.	Port name	Function name	I/O	Outline of functions
5	P06	XI	I	Initial setting switch. Hight level=ON
6	XO	XO	O	
7	P17	AVdd	I	D/A converter standard voltage(DC 5V).
8	P27	AD7	I	Key input terminal.
9	P26	AD6	I	Key input terminal.
10	P25	AD5	I	Key input terminal.
11	P24	AD4	I	Key input terminal.
12	P16	AVss		GND terminal.
13	P23	AD3	I	Key input terminal.
14	P22	AD2	I	A/D input port for LEVEL METER indication.
15	P21	AD1	I	A/D input port for LEVEL METER indication.
16	P20	AD0	I	A/D input port for music search.
17	P07	RST	I	Reset input.
18	1RQ1	R-SI	I	Remote control input.
19	1RQf	VOLT DN	I	Power on/off detection terminal. Low level=OFF
20	P13	DOLBY-B	I	Input port to switch DOLBY display.
21	P12	DOLBY-C	I	Input port to switch DOLBY display.
22	P05	IND.CONT	O	High level on stand-by or display off and after power off.
23	P04	MONITOR	O	High level on MONITOR mode. Low level on SOURCE mode.
24	P03	REC	O	REC/PLAY switching terminal. High level on REC.
25	P02	BIAS	O	BIAS control terminal. High level=BIAS ON
26	P01	REC MUTE	O	Recording amp. muting terminal. High level=MUTING ON
27	P00	PB MUTE	O	Playback amp. muting terminal. High level=MUTING ON
28	P47	LINE MUTE	O	Line muting terminal. High level=MUTING ON
29	P46	RM1	O	Reel motor control. High level=active
30	P45	RM2	O	Reel motor control. High level=active
31	P44	RPC	O	Reel motor power control. High level=power down
32	P43	CPM	O	Capstan motor control.

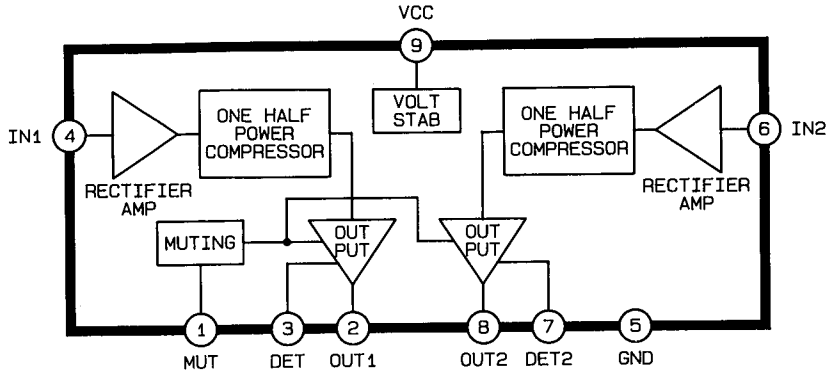
NOTE: Low level=0V
High level=5.1V

IC BLOCK DIAGRAM

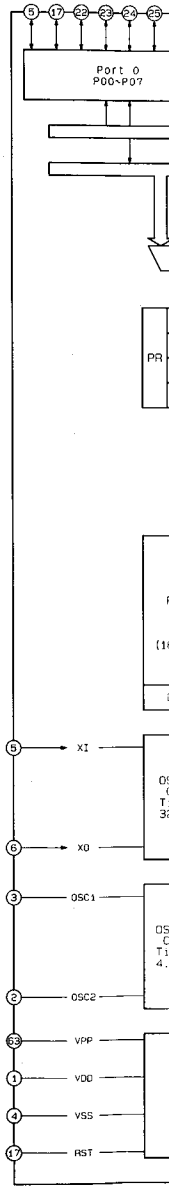
IC201 : μPC45710C
Dual OP-Amp.



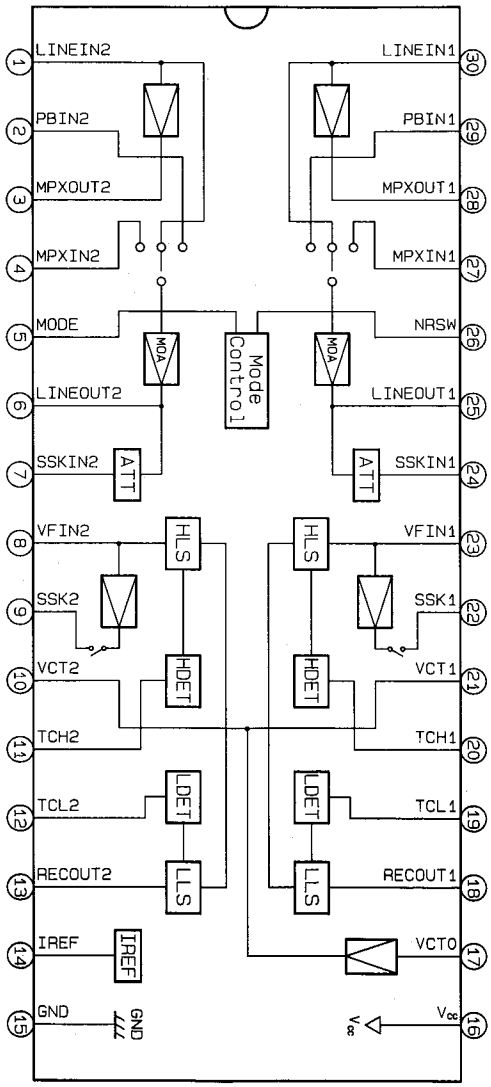
IC401 : BA6138
Signal Level Meter



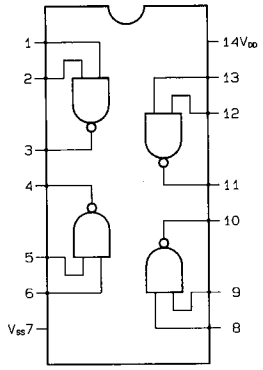
IC901 : MN18716
Logic Controller



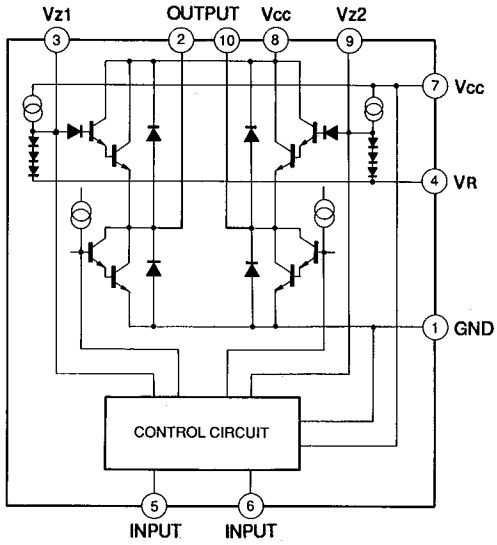
IC501 : CXA1330S
Dolby B/C NR



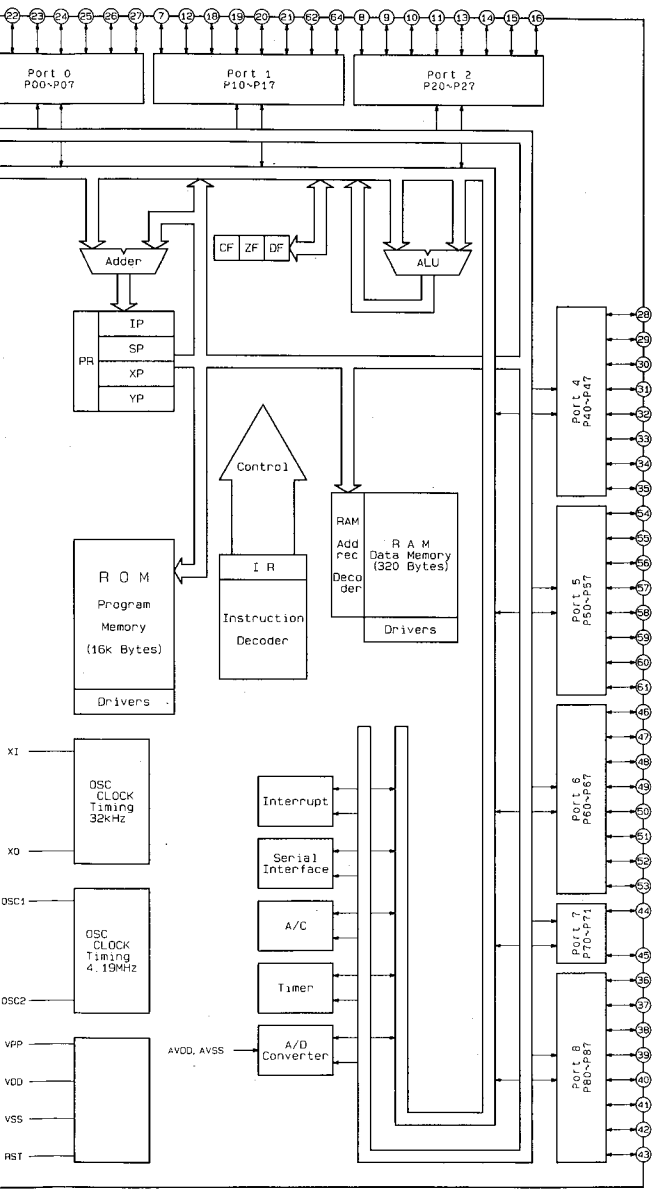
IC701 : TC4011BP
2-Input NAND Gate



IC801 : BA6229
Motor Driver



: MN187167J
Controller



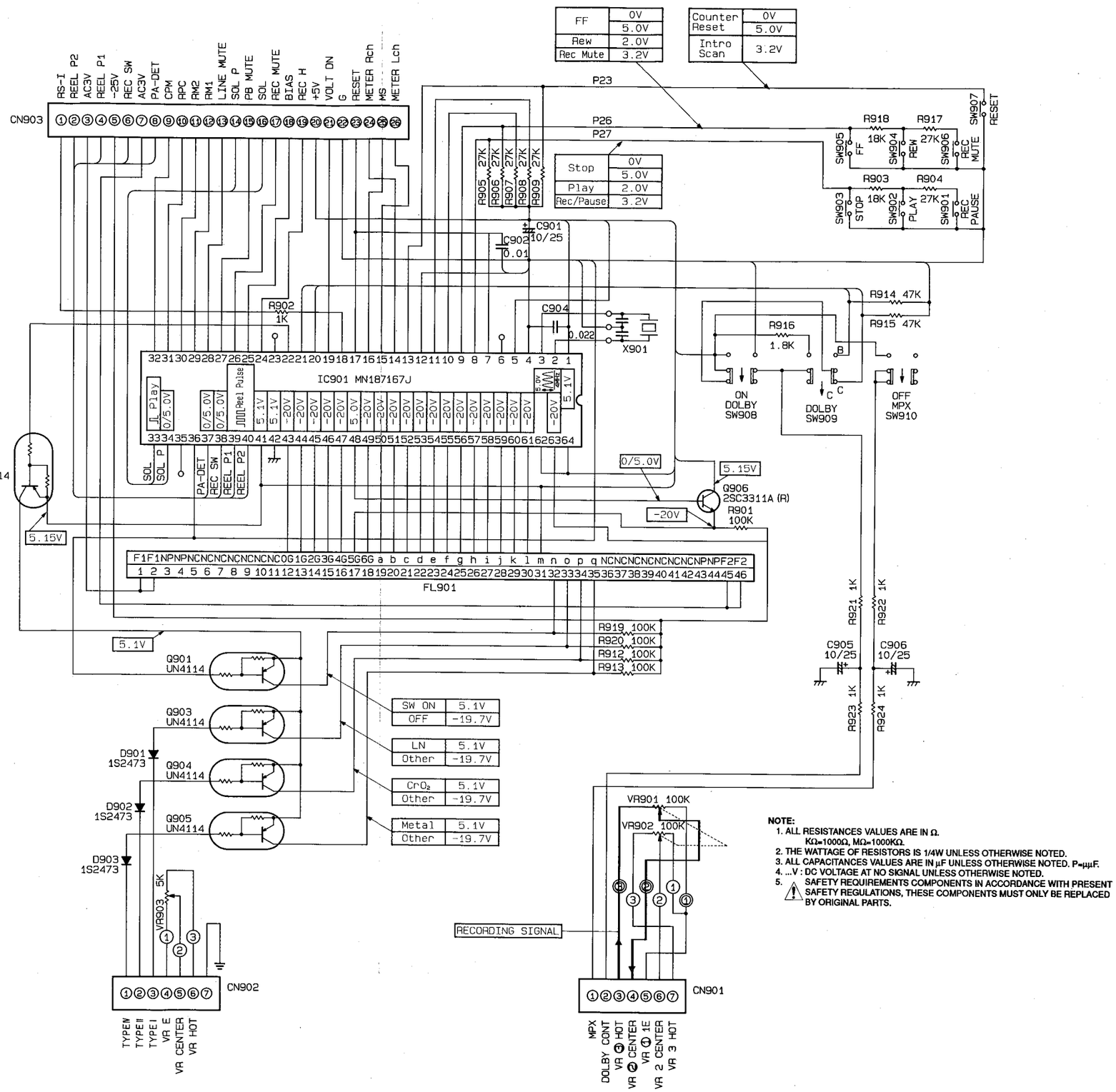
TERMINAL FUNCTIONS

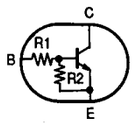
Pin No.	Port name	Function name	I/O	Outline of functions
5	P06	XI	I	Initial setting switch. Hight level=ON
6	XO	XO	O	
7	P17	AVdd	I	D/A converter standard voltage(DC 5V).
8	P27	AD7	I	Key input terminal.
9	P26	AD6	I	Key input terminal.
10	P25	AD5	I	Key input terminal.
11	P24	AD4	I	Key input terminal.
12	P16	AVss		GND terminal.
13	P23	AD3	I	Key input terminal.
14	P22	AD2	I	A/D input port for LEVEL METER indication.
15	P21	AD1	I	A/D input port for LEVEL METER indication.
16	P20	AD0	I	A/D input port for music search.
17	P07	RST	I	Reset input.
18	1RQ1	R-SI	I	Remote control input.
19	1RQf	VOLT DN	I	Power on/off detection terminal. Low level=OFF
20	P13	DOLBY-B	I	Input port to switch DOLBY display.
21	P12	DOLBY-C	I	Input port to switch DOLBY display.
22	P05	IND.CONT	O	High level on stand-by or display off and after power off.
23	P04	MONITOR	O	High level on MONITOR mode. Low level on SOURCE mode.
24	P03	REC	O	REC/PLAY switching terminal. High level on REC.
25	P02	BIAS	O	BIAS control terminal. High level=BIAS ON
26	P01	REC MUTE	O	Recording amp. muting terminal. High level=MUTING ON
27	P00	PB MUTE	O	Playback amp. muting terminal. High level=MUTING ON
28	P47	LINE MUTE	O	Line muting terminal. High level=MUTING ON
29	P46	RM1	O	Reel motor control. High level=active
30	P45	RM2	O	Reel motor control. High level=active
31	P44	RPC	O	Reel motor power control. High level=power down
32	P43	CPM	O	Capstan motor control.

NOTE: Low level=0V
High level=5.1V

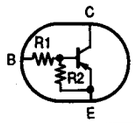
SCHEMATIC DIAGRAM (1)

PCB-2 **Front P. C. Board**





Type	R1(kΩ)	R2(kΩ)
UN4214	10	47



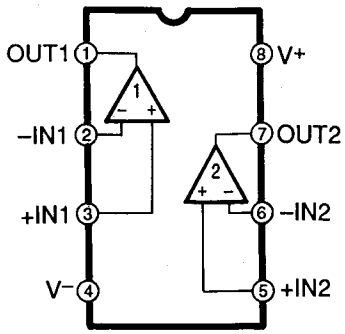
Type	R1(kΩ)	R2(kΩ)
UN4114	10	47

NOTE:

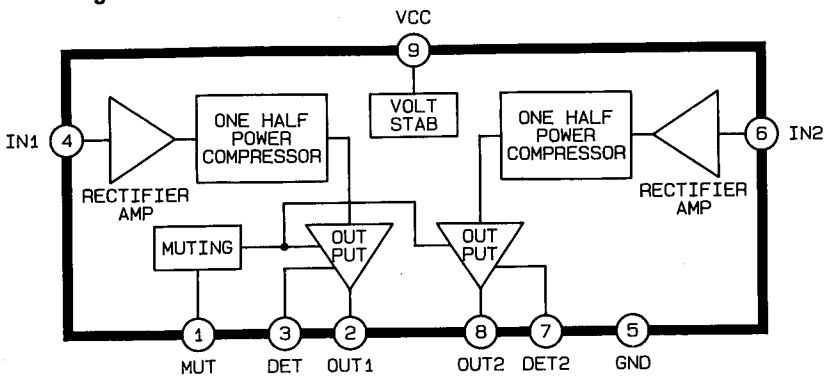
1. ALL RESISTANCES VALUES ARE IN Ω.
   KΩ=1000Ω, MΩ=1000KΩ.
2. THE WATTAGE OF RESISTORS IS 1/4W UNLESS OTHERWISE NOTED.
3. ALL CAPACITANCES VALUES ARE IN μF UNLESS OTHERWISE NOTED. P=μμF.
4. ...V : DC VOLTAGE AT NO SIGNAL UNLESS OTHERWISE NOTED.
5. ⚠ SAFETY REQUIREMENTS COMPONENTS IN ACCORDANCE WITH PRESENT SAFETY REGULATIONS, THESE COMPONENTS MUST ONLY BE REPLACED BY ORIGINAL PARTS.

IC BLOCK DIAGRAM

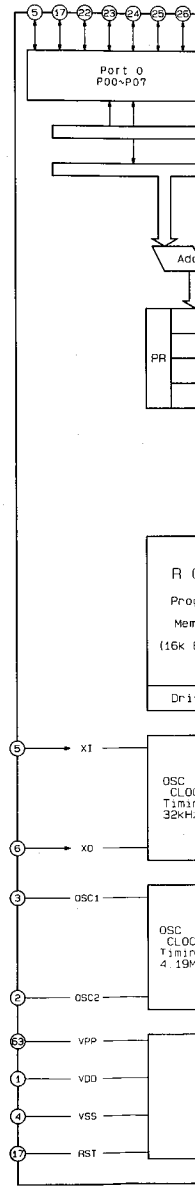
IC201 : μPC45710C
Dual OP-Amp.



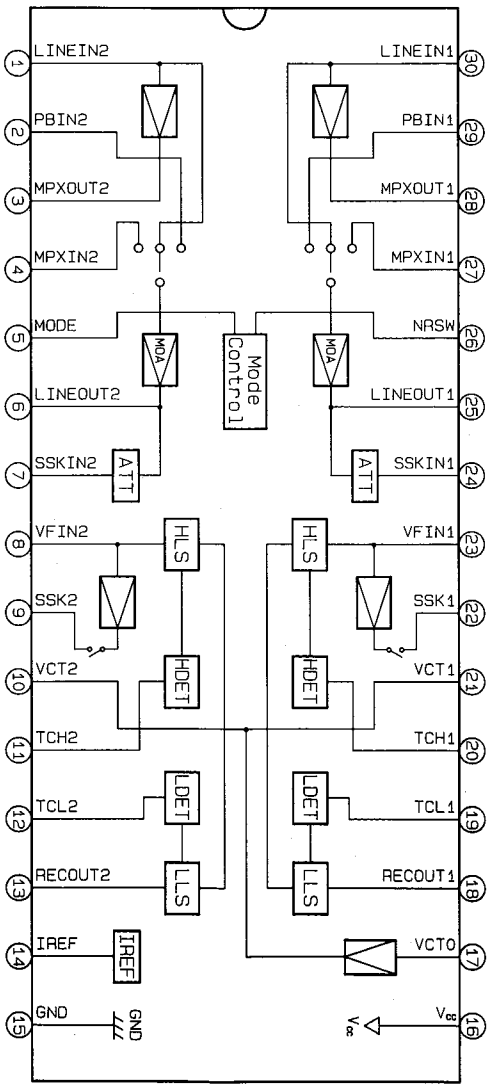
IC401 : BA6138
Signal Level Meter



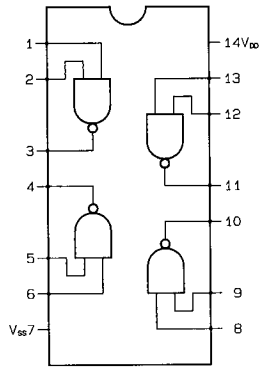
IC901 : MN187167J
Logic Controller



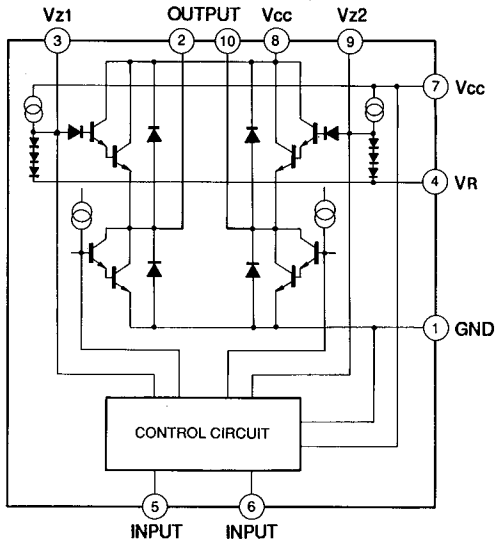
IC501 : CXA1330S
Dolby B/C NR



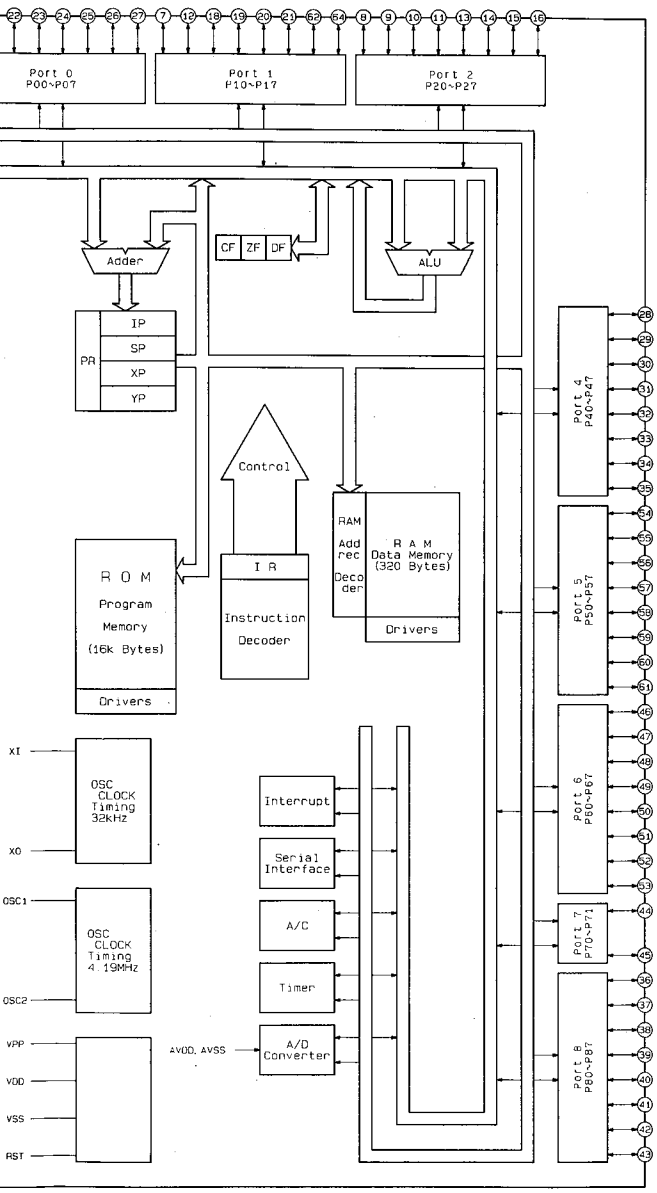
IC701 : TC4011BP
2-Input NAND Gate



IC801 : BA6229
Motor Driver



: MN187167J
Controller

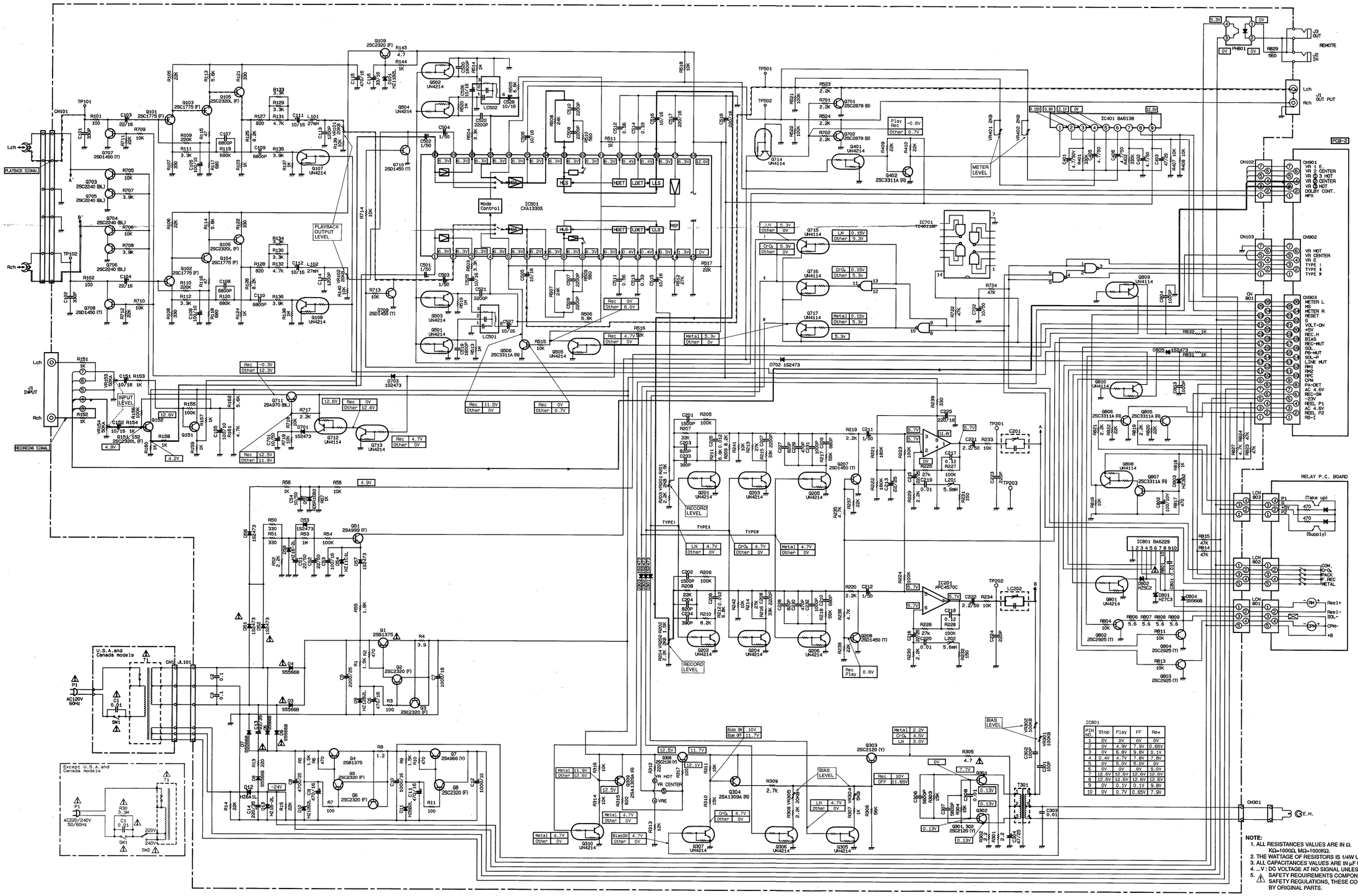


TERMINAL FUNCTIONS

Pin No.	Port name	Function name	I/O	Outline of functions
5	P06	XI	I	Initial setting switch. Hight level=ON
6	XO	XO	O	
7	P17	AVdd	I	D/A converter standard voltage(DC 5V).
8	P27	AD7	I	Key input terminal.
9	P26	AD6	I	Key input terminal.
10	P25	AD5	I	Key input terminal.
11	P24	AD4	I	Key input terminal.
12	P16	AVss		GND terminal.
13	P23	AD3	I	Key input terminal.
14	P22	AD2	I	A/D input port for LEVEL METER indication.
15	P21	AD1	I	A/D input port for LEVEL METER indication.
16	P20	AD0	I	A/D input port for music search.
17	P07	RST	I	Reset input.
18	1RQ1	R-SI	I	Remote control input.
19	1RQf	VOLT DN	I	Power on/off detection terminal. Low level=OFF
20	P13	DOLBY-B	I	Input port to switch DOLBY display.
21	P12	DOLBY-C	I	Input port to switch DOLBY display.
22	P05	IND.CONT	O	High level on stand-by or display off and after power off.
23	P04	MONITOR	O	High level on MONITOR mode. Low level on SOURCE mode.
24	P03	REC	O	REC/PLAY switching terminal. High level on REC.
25	P02	BIAS	O	BIAS control terminal. High level=BIAS ON
26	P01	REC MUTE	O	Recording amp. muting terminal. High level=MUTING ON
27	P00	PB MUTE	O	Playback amp. muting terminal. High level=MUTING ON
28	P47	LINE MUTE	O	Line muting terminal. High level=MUTING ON
29	P46	RM1	O	Reel motor control. High level=active
30	P45	RM2	O	Reel motor control. High level=active
31	P44	RPC	O	Reel motor power control. High level=power down
32	P43	CPM	O	Capstan motor control.

NOTE: Low level=0V
High level=5.1V

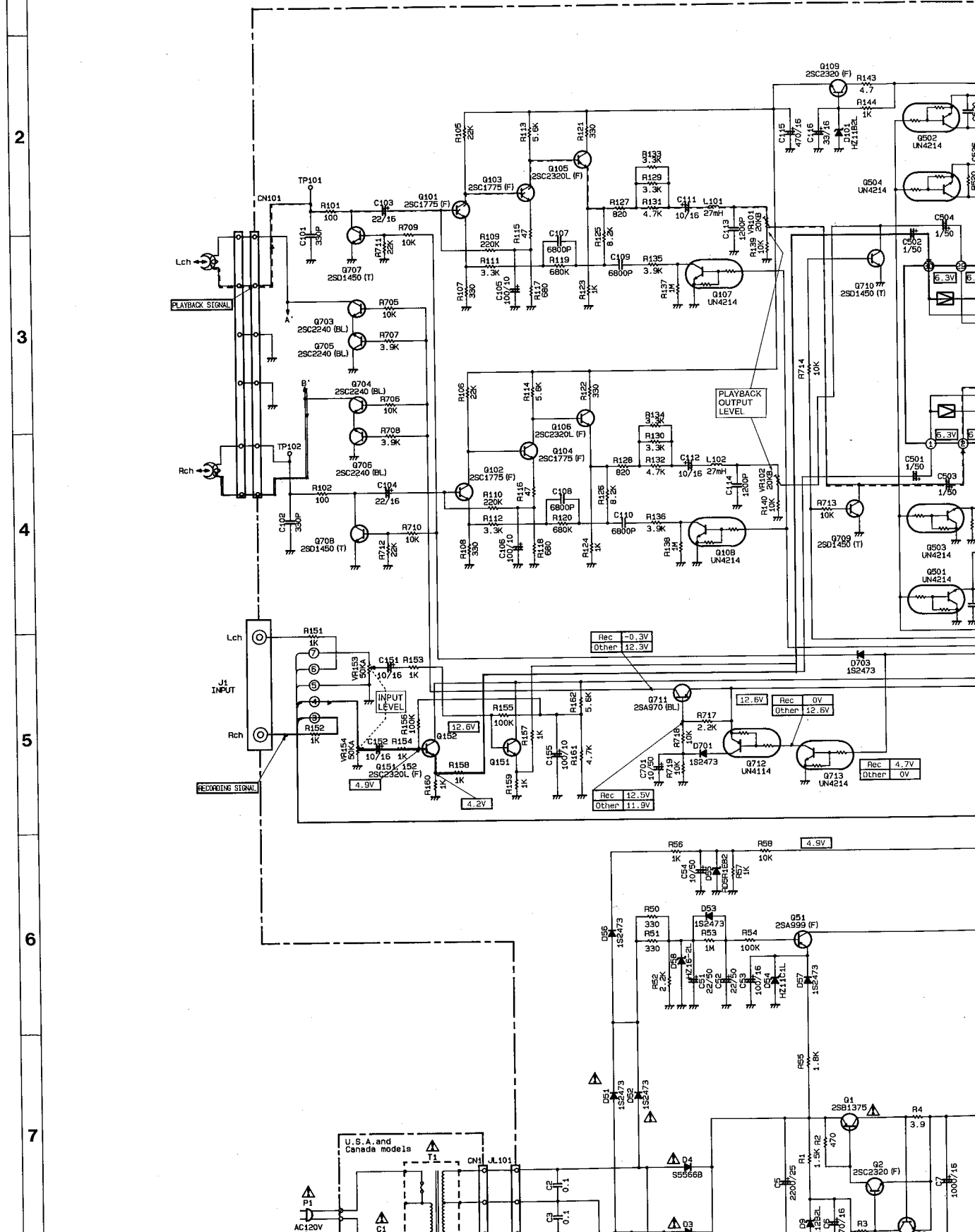
SCHEMATIC DIAGRAM (2)

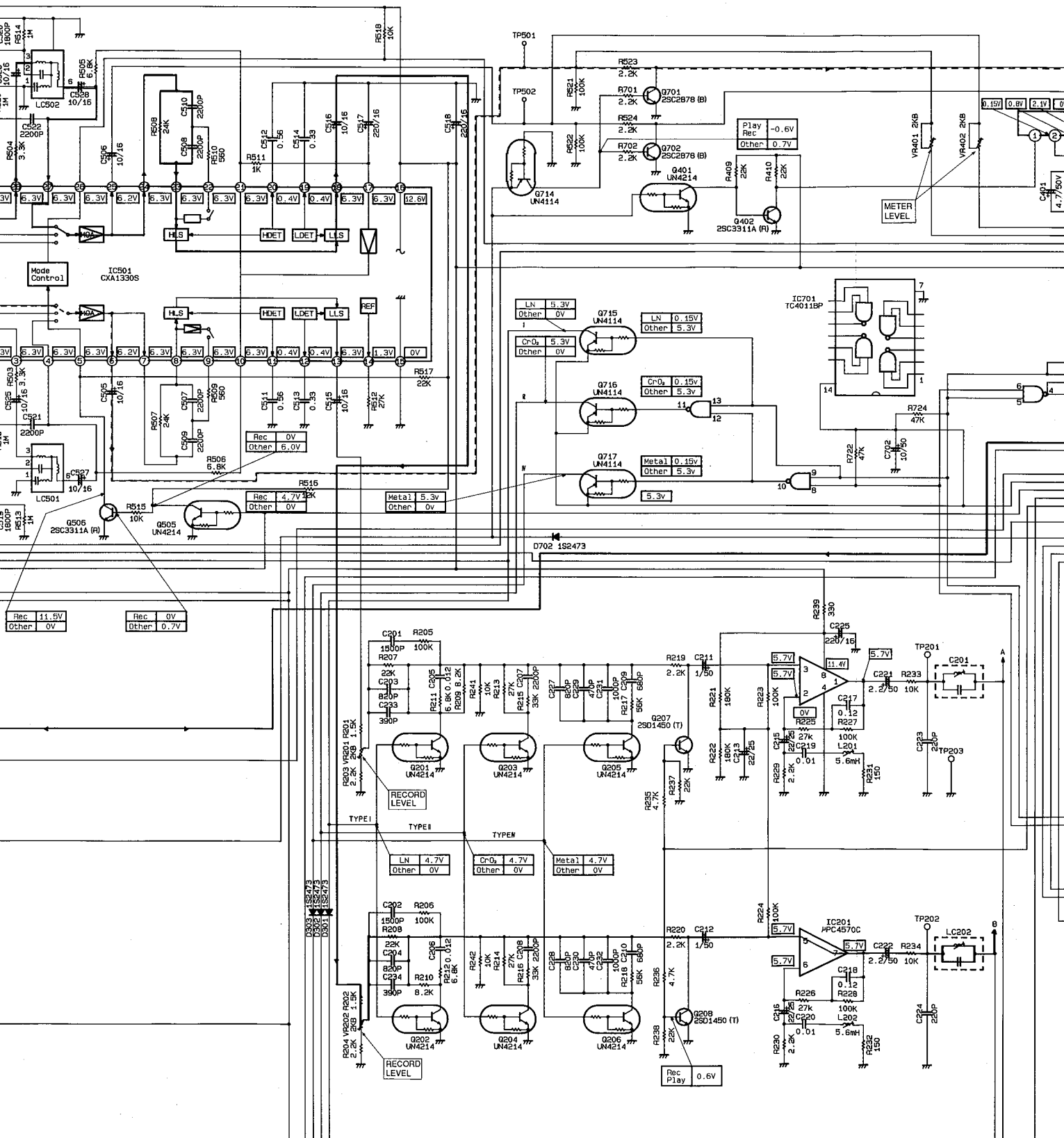

PLAYBACK SIGNAL
RECORDING SIGNAL
PLAYBACK OUTPUT LEVEL
INPUT LEVEL
RECORD LEVEL
METER LEVEL
BIAS LEVEL
REMOTE
RELAY P.C. BOARD
PCB-2
U.S.A.and Canada models
Except U.S.A.and Canada models
AC120V 60Hz
AC220/240V 50/60Hz
Mode Control
IC501 CXA1330S
IC401 BA6138
IC801 BA6229
IC701 TC4011BP
IC201 NJM4570C
IC801
PIN NO. | Stop | Play | FF | Rew
1 | 0V | 0V | 0V | 0V
2 | 0V | 4.9V | 7.9V | 0.65V
3 | 0V | 6.8V | 9.8V | 0.1V
4 | 0.4V | 4.7V | 7.8V | 7.8V
5 | 0V | 5.0V | 5.0V | 0V
6 | 0V | 0V | 0V | 5.0V
7 | 12.6V | 12.6V | 12.6V | 12.6V
8 | 12.6V | 12.6V | 12.6V | 12.6V
9 | 0V | 0.1V | 0.1V | 9.8V
10 | 0V | 0.7V | 0.65V | 7.9V

NOTE:

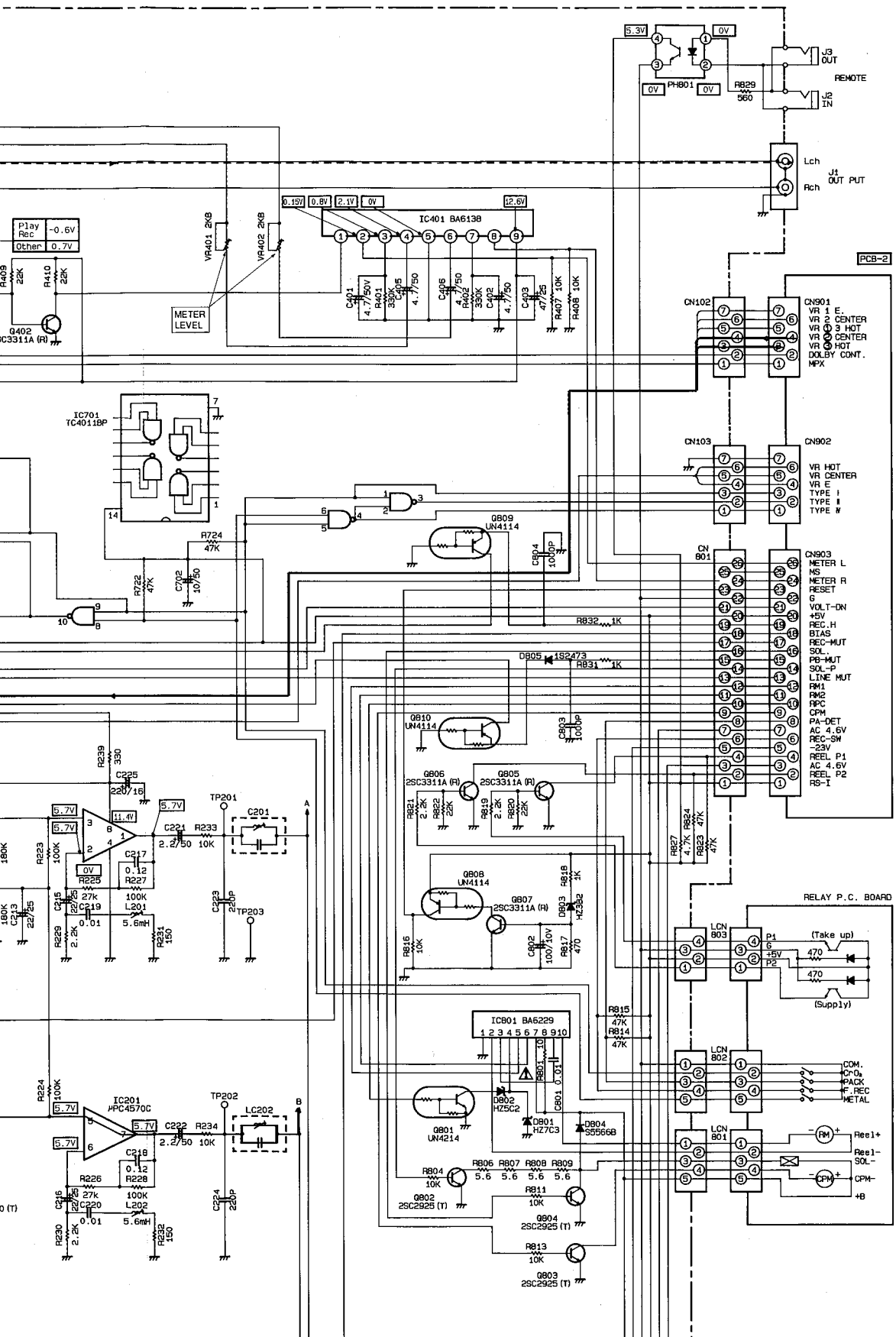
1. ALL RESISTANCES VALUES ARE IN Ω.
   KΩ=1000Ω, MΩ=1000KΩ.
2. THE WATTAGE OF RESISTORS IS 1/4W UNLESS OTHERWISE NOTED.
3. ALL CAPACITANCES VALUES ARE IN μF UNLESS OTHERWISE NOTED. P=μμF.
4. ...V : DC VOLTAGE AT NO SIGNAL UNLESS OTHERWISE NOTED.
5. ⚠ SAFETY REQUIREMENTS COMPONENTS IN ACCORDANCE WITH PRESENT SAFETY REGULATIONS, THESE COMPONENTS MUST ONLY BE REPLACED BY ORIGINAL PARTS.

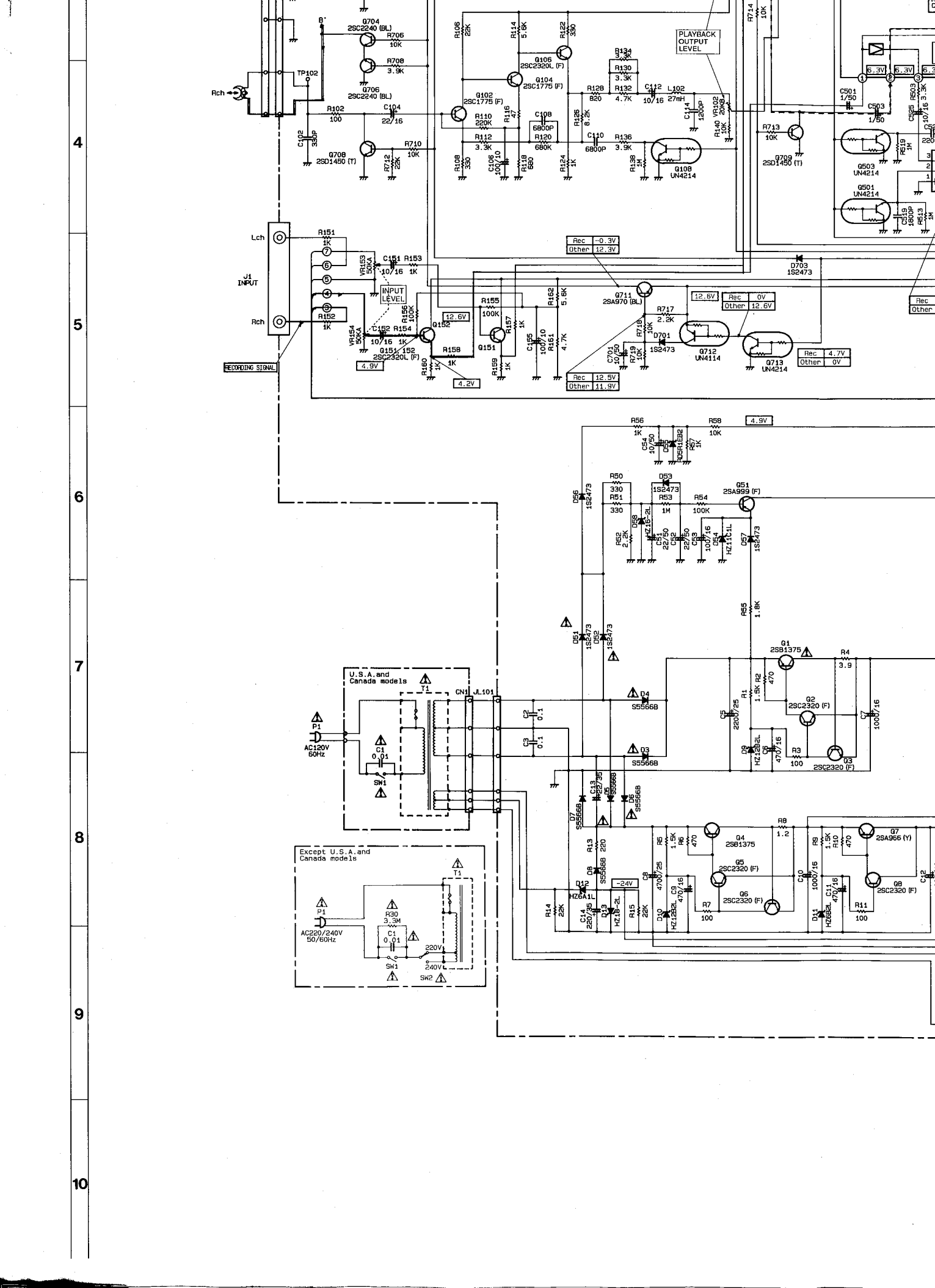
SCHEMATIC DIAGRAM (2)

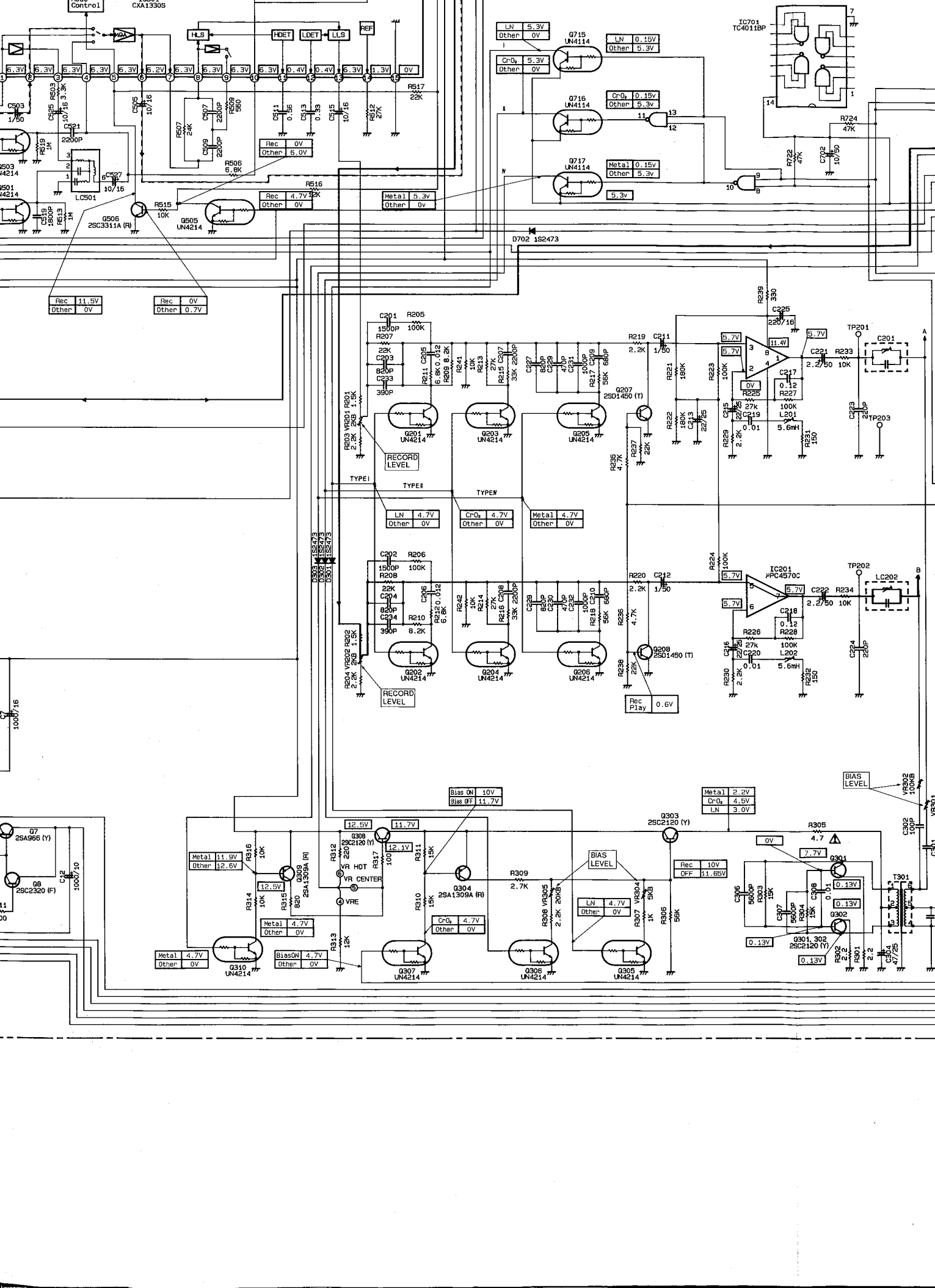


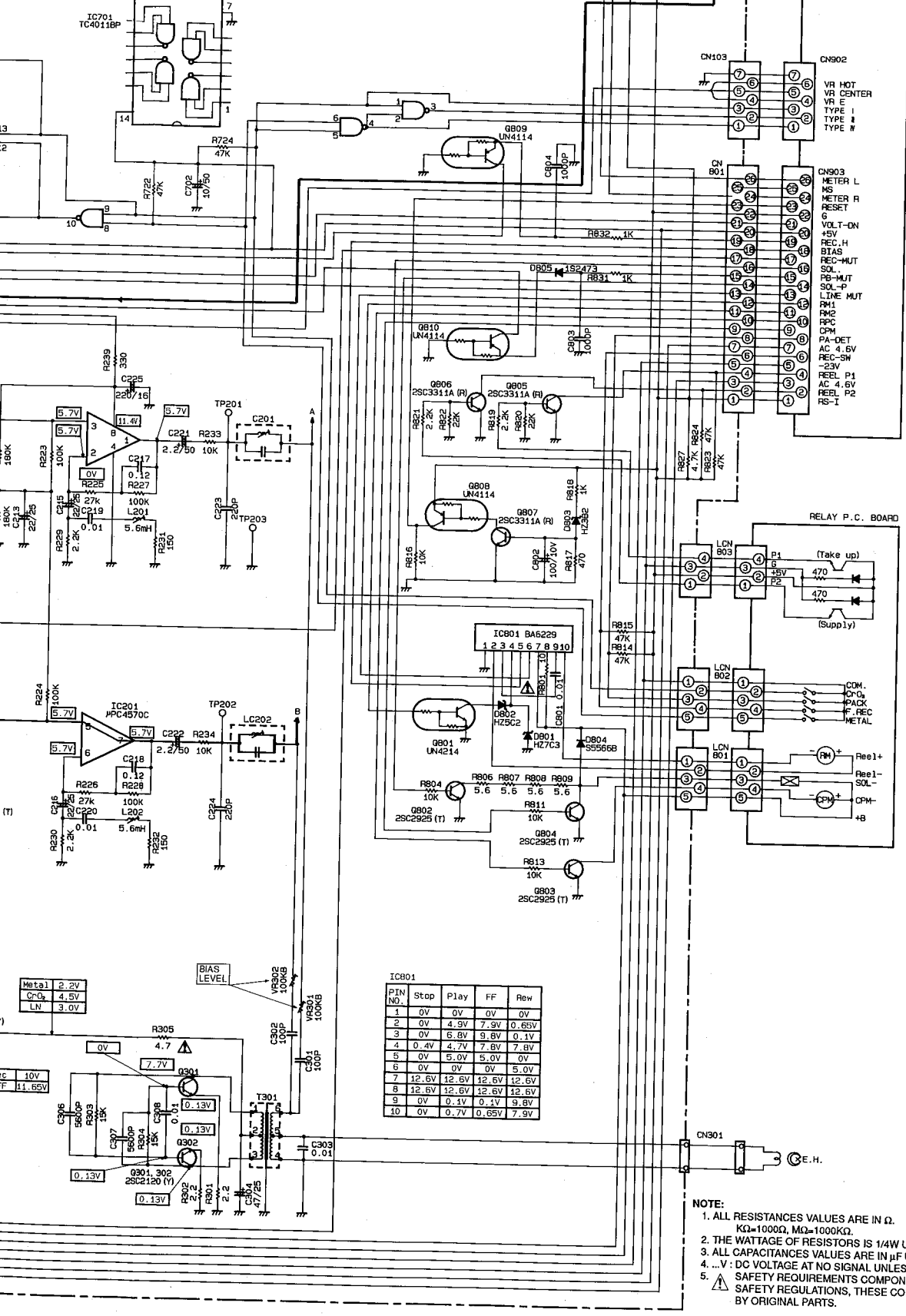

Mode Control
IC501 CXA1330S
LC501
LC502
Q505 UN4214
Q506 2SC3311A (R)
HLS
HDET
LDET
LLS
REF
MOA
TP501
TP502
Q714 UN4114
Q701 2SC2878 (B)
Q702 2SC2878 (B)
Q401 UN4214
Q402 2SC3311A (R)
METER LEVEL
IC701 TC4011BP
Q715 UN4114
Q716 UN4114
Q717 UN4114
D702 1S2473
Q201 UN4214
Q202 UN4214
Q203 UN4214
Q204 UN4214
Q205 UN4214
Q206 UN4214
Q207 2SD1450 (T)
Q208 2SD1450 (T)
IC201 μPC4570C
RECORD LEVEL
TYPE I
TYPE II
TYPE IV
TP201
TP202
TP203
LC201
LC202

	J	K	L	M	N


5.3V
0V
PH801
J3 OUT
REMOTE
J2 IN
R829 560
Lch
Rch
J1 OUT PUT
IC401 BA6138
0.15V 0.8V 2.1V 0V 12.6V
VR401 2kB
VR402 2kB
METER LEVEL
Play Rec -0.6V
Other 0.7V
Q402 2SC3311A (R)
PCB-2
CN102
CN901
VR 1 E.
VR 2 CENTER
VR 3 HOT
VR 4 CENTER
VR 5 HOT
DOLBY CONT.
MPX
CN103
CN902
VR HOT
VR CENTER
VR E
TYPE I
TYPE II
TYPE IV
CN 801
CN903
METER L
MS
METER R
RESET
G
VOLT-DN
+5V
REC.H
BIAS
REC-MUT
SOL.
PB-MUT
SOL-P
LINE MUT
RM1
RM2
APC
CPM
PA-DET
AC 4.6V
REC-SW
-23V
REEL P1
AC 4.6V
REEL P2
RS-I
IC701 TC4011BP
Q809 UN4114
Q810 UN4114
Q808 UN4114
Q807 2SC3311A (R)
Q806 2SC3311A (R)
Q805 2SC3311A (R)
D805 1S2473
R832 1K
R831 1K
R724 47K
R732 47K
C702 10/50
C804 1000P
C803 1000P
C802 100/10V
R816 10K
R818 1K
D803 HZ3B2
R817 470
R815 47K
R814 47K
R827 4.7K
R824 47K
R823 47K
R821 2.2K
R822 22K
R819 2.2K
R820 22K
RELAY P.C. BOARD
LCN 803
P1
G
+5V
P2
(Take up)
(Supply)
470
470
LCN 802
COM.
CrO2
PACK
F.REC
METAL
LCN 801
Reel+
Reel-
SOL-
CPM-
+B
ICB01 BA6229
R803 10
C801 0.01
D802 HZ5C2
D801 HZ7C3
D804 S5566B
Q801 UN4214
R804 10K
R806 5.6
R807 5.6
R808 5.6
R809 5.6
R811 10K
R813 10K
Q802 2SC2925 (T)
Q804 2SC2925 (T)
Q803 2SC2925 (T)
R239 330
C225 220/16
TP201
C201
C221 2.2/50
R233 10K
R223 100K
C217 0.12
R225 27k
R227 100K
C219 0.01
L201 5.6mH
C223 220P
TP203
R229 2.2K
R231 150
IC201 μPC4570C
R224 100K
TP202
LC202
C222 2.2/50
R234 10K
C218 0.12
R226 27k
R228 100K
C220 0.01
L202 5.6mH
C224 220P
R230 2.2K
R232 150


PLAYBACK OUTPUT LEVEL
INPUT LEVEL
RECORDING SIGNAL
U.S.A.and Canada models
Except U.S.A.and Canada models
AC120V 60Hz
AC220/240V 50/60Hz
Lch
Rch
J1 INPUT
TP102
Q704 2SC2240 (BL)
Q706 2SC2240 (BL)
Q708 2SD1450 (T)
Q102 2SC1775 (F)
Q104 2SC1775 (F)
Q106 2SC2320L (F)
Q108 UN4214
Q151,152 2SC2320L (F)
Q711 2SA970 (BL)
Q712 UN4114
Q713 UN4214
Q503 UN4214
Q501 UN4214
Q709 2SD1450 (T)
Q1 2SB1375
Q2 2SC2320 (F)
Q3 2SC2320 (F)
Q4 2SB1375
Q5 2SC2320 (F)
Q6 2SC2320 (F)
Q7 2SA966 (Y)
Q8 2SC2320 (F)
Q51 2SA999 (F)
D701 1S2473
D703 1S2473
CN1 J.101
T1
SW1
SW2
Rec -0.3V Other 12.3V
Rec 12.5V Other 11.9V
Rec 4.7V Other 0V
Rec 0V Other 12.6V
12.6V
4.9V
4.2V
-24V


Control
CXA1330S
HLS
HDET
LDET
LLS
REF
IC701
TC4011BP
Q715
UN4114
Q716
UN4114
Q717
UN4114
D702 1S2473
Q506
2SC3311A (R)
Q505
UN4214
LC501
Q201
UN4214
Q203
UN4214
Q205
UN4214
Q207
2SD1450 (T)
Q202
UN4214
Q204
UN4214
Q206
UN4214
Q208
2SD1450 (T)
IC201
μPC4570C
LC202
TP201
TP202
TP203
RECORD LEVEL
TYPE I
TYPE II
TYPE IV
Q303
2SC2120 (Y)
Q304
2SA1309A (R)
Q305
UN4214
Q306
UN4214
Q307
UN4214
Q308
2SC2120 (Y)
Q309
2SA1309A (R)
Q310
UN4214
Q301, 302
2SC2120 (Y)
Q7
2SA966 (Y)
Q8
2SC2320 (F)
BIAS LEVEL
VR HOT
VR CENTER
VRE
T301



Metal	2.2V
CrO_2	4.5V
LN	3.0V

IC801

PIN NO.	Stop	Play	FF	Rew
1	0V	0V	0V	0V
2	0V	4.9V	7.9V	0.65V
3	0V	6.8V	9.8V	0.1V
4	0.4V	4.7V	7.8V	7.8V
5	0V	5.0V	5.0V	0V
6	0V	0V	0V	5.0V
7	12.6V	12.6V	12.6V	12.6V
8	12.6V	12.6V	12.6V	12.6V
9	0V	0.1V	0.1V	9.8V
10	0V	0.7V	0.65V	7.9V

NOTE:

1. ALL RESISTANCES VALUES ARE IN Ω.
   KΩ=1000Ω, MΩ=1000KΩ.
2. THE WATTAGE OF RESISTORS IS 1/4W UNLESS OTHERWISE NOTED.
3. ALL CAPACITANCES VALUES ARE IN μF UNLESS OTHERWISE NOTED. P=μμF.
4. ...V : DC VOLTAGE AT NO SIGNAL UNLESS OTHERWISE NOTED.
5. ⚠ SAFETY REQUIREMENTS COMPONENTS IN ACCORDANCE WITH PRESENT SAFETY REGULATIONS, THESE COMPONENTS MUST ONLY BE REPLACED BY ORIGINAL PARTS.